

# Rock Products

THE INDUSTRY'S ROCK-OLDS AUTHORITY

JULY • 1958

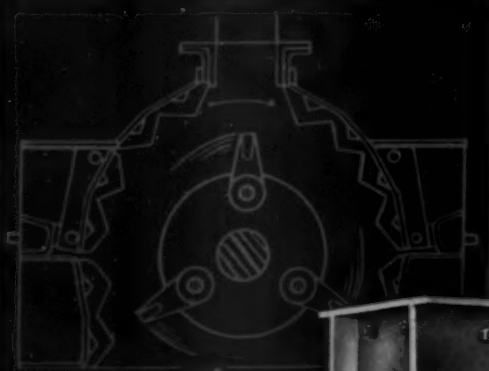
**You can do something about  
rising freight rates**

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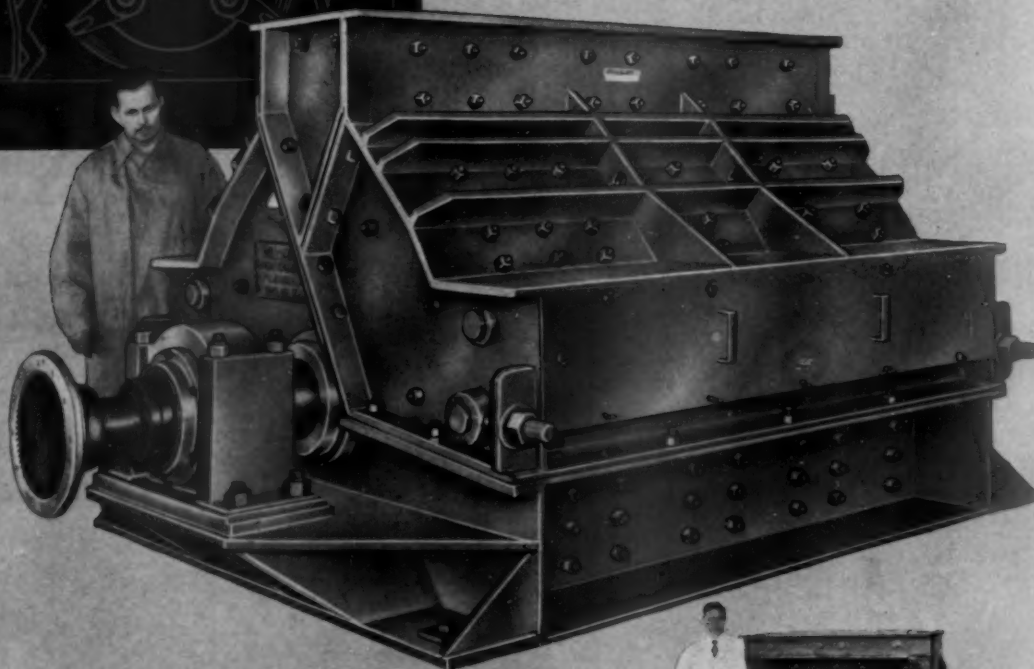


**A practical look at the AGL system**

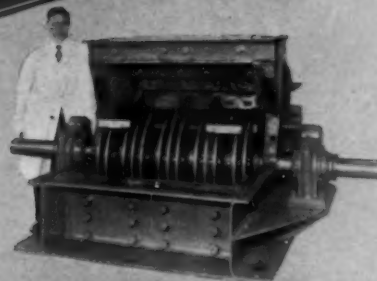
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## **WILLIAMS REVERSIBLE IMPACTOR**



- 100% Impact Reduction
- No Friction Or Abrasion
- Unobstructed Discharge
- Less Upkeep Expense



Internal view showing manganese steel impact blocks, hammers and liners. Rugged, heavy steel plate construction. Extra large shafts are mounted in oversize bearings sealed in self-aligning housings.

### **Unequalled For Secondary Grinding**

Reduces limestone and material of similar hardness to  $1\frac{1}{2}$ ",  $\frac{3}{4}$ " or smaller. Properly adjusted, the Williams Impactor makes excellent material with the proper percentage of fines for road base course. Unusually low upkeep expense as reduction is 100% by impact. Material is fed to enter between the hammers and is thrown against the impact blocks setting up a repeated ricochet action which accomplishes the reduction. Adjustable impact blocks adjust for wear. A reversing

switch on motor permits rotating hammers in either direction, to the left today and to the right tomorrow, thereby giving double hammer life. No grates are used. Entire bottom is open permitting unobstructed discharge of crushed material and less wear and tear. A size for every job. Let us tell you about one for your use.

**WILLIAMS PATENT CRUSHER & PULVERIZER CO.**  
800 ST. LOUIS AVE. St. Louis 6, Mo.



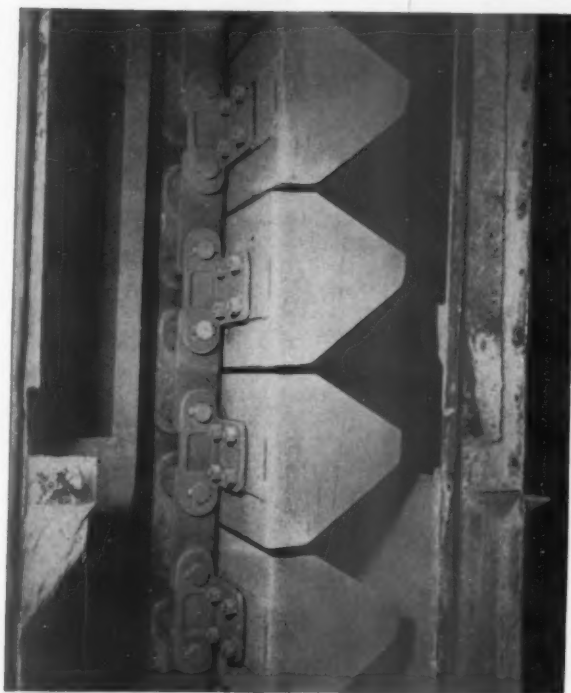
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**WILLIAMS**  
CRUSHERS GRINDERS SHREDDERS  
Oldest and Largest Manufacturers of Hammer Mills in the World





# This Link-Belt SS chain has carried over one million tons annually for 16 years



**LINK-BELT SS-1146 BUSHED CHAIN** on elevator at Whitehall Cement Mfg. Co. measures 20 $\frac{1}{16}$  in. wide. This original chain has been in use since 1941 and, considering the rugged conditions, has needed amazingly few replacements of pins, bushings or links.

## 18 million tons, 26 years later... SS-856 chain still serviceable

### Sets record in cement mill elevator service

The more than quarter-century of continuous handling of raw materials at a Pennsylvania cement mill illustrates the long-wearing durability of Link-Belt SS-856 elevator chain. This amazing service record under extremely tough conditions proves that it pays to pick the right chain from Link-Belt's complete line.

Link-Belt SS-856 chain is made of high carbon steel sidebars with nickel alloy pins and bushings. Hardened sidebars give additional strength plus greater resistance to wear and pitch hole distortion. In addition, accurately machined pitch holes assure proper pitch and tight press fit of mating parts—extend chain life. The hard, smooth surfaces of steel joints repel gritty materials... resist abrasion.

Link-Belt elevator chains are available with ultimate strengths up to 200,000 lbs.



## Installed on elevators handling cement clinker 24 hours a day

The remarkable performance of Link-Belt SS-1146 bushed chain at Whitehall Cement Mfg. Co., Cementon, Pa., testifies to its exceptional strength and wear resistance... emphasizes the economy of choosing the right chain for a specific job. Since 1941, each of three elevators has handled approximately 17 million tons of highly abrasive cement clinker.

### Repeated success

This outstanding record of continuous chain service under the toughest conditions is by no means a rare case. Numerous installations report similar results achieved with this long-life wear-resistant chain.

Link-Belt SS-1146 bushed chain offers large joint bearing surfaces for greater wear resistance and trouble-free service in heavy-duty conveying and elevating. Sidebars of selected steel are accurately formed and machined for tight press fit of pins and bushings. The latter are made from tough, hardened steel and locked against rotation in sidebars.

### For abrasive jobs

These straight steel sidebars with hardened steel pins and bushings provide needed strength to resist heavy continuous loads. Smooth, hardened surfaces resist abrasive action of gritty materials, prevent packing in critical joints.

## Link-Belt SS-102 $\frac{1}{2}$ bushed chain extends life of stone elevator

Several years ago an eastern stone quarry installed a main bucket elevator to handle 200 tons per hour of minus 2 $\frac{1}{4}$ -in. mixed stone. Service life of the original two-strand elevator chain was found inadequate. After several shutdowns, it was replaced with Link-Belt SS-102 $\frac{1}{2}$  chain with K-5 attachments at every third link.

This long-life, wear-resistant chain is now in its fourth year of uninterrupted operation. It has carried over 475,000 tons as compared to 60,000 tons which was normal life for the previous chain.

Recent inspection of the SS-102 $\frac{1}{2}$  chain reveals that it is good for another long stretch of service. Elimination of shutdowns and replacements more than justified the slight difference in cost between this and the original chain.

**STONE ELEVATOR** has buckets at every third link. Centers are 65 feet, with elevator inclined 75 degrees from the grade. Chain speed is 280 feet per minute.



**HEADQUARTERS** for chains, sprockets and other Link-Belt products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor. Refer to the yellow pages of your local telephone directory.

**LINK-BELT COMPANY:** Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

# LINK-BELT

CHAINS AND SPROCKETS



## FEATURES

### You can do something about rising freight rates • Joseph N. Bell 74

*A sand and gravel producer—Ellis Jensen—prevented a rise in the rates in his area and set a pattern that you, too, can follow*

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### Induction motor maintenance • Samzelius & Wolf 112

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B.F. Goodrich



## Punching a 3-mile hole through a granite mountain

### *B.F. Goodrich improvements in rubber brought extra savings*

**Problem:** That picture was taken inside a mountain where men and machines are digging a tunnel for a power project. As fast as the sharp, jagged rocks—some of them boulders six feet wide—are blasted out, they're dumped on a conveyor belt and carried to mine cars. But the constant smash of heavy rock soon pounded the conveyor belt to death.

**What was done:** The project engineer chose a B.F. Goodrich Nyfil cord mucker belt to replace the ruined belt. This belt is designed to stand heavy impact. Nyfil fabric, made of chemically produced fiber, at the center of the belt

gives it strength without extra weight. Cords running lengthwise at top and bottom of belt are surrounded by rubber. There are no cross threads binding them together, so they are free to give on impact, with rubber taking the shock.

For extra protection against impact, B.F. Goodrich used its patented *Trans-cord breaker*, an extra layer of parallel cords in rubber placed across the belt width and around the edges. It increases adhesion of cover to carcass by 50%, and prevents gouges and cuts from splitting the belt cover, keeps cover from tearing away from carcass

of the belt under severe impact.

**Savings:** The B.F. Goodrich belt has lasted six months, is still going strong. While it cost nearly half again as much as the belt it replaced, the contractor says it's already paid off by giving twice the service, without costly shut-downs for repairs.

**Where to buy:** Your B.F. Goodrich distributor has full information on the conveyor belt described here. And, as a factory-trained specialist in rubber products, he can answer your questions about *all* the rubber products B.F. Goodrich makes for industry. B.F. Goodrich Industrial Products Company, Department M-404, Akron 18, Ohio.

## B.F. Goodrich *industrial products*

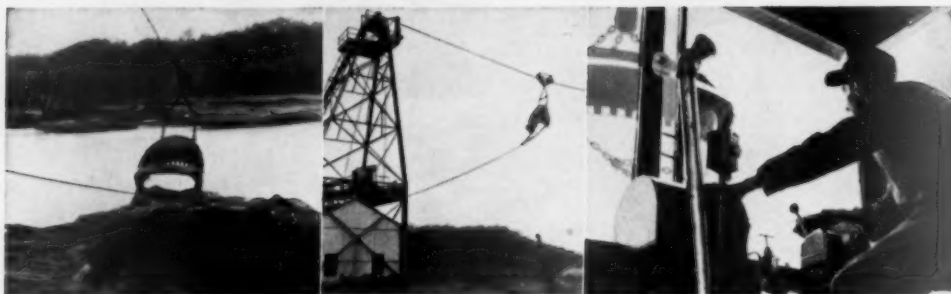
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ROCK PRODUCTS, July, 1958

# These Special Excavating Jobs Are Best Handled by Sauerman DragScrapers

## Deep Digging

900-FT. SPAN—  
65 FT. BELOW  
WATER...



Load is deposited by tensioning the track cable, thus lifting the DragScraper from the pile. Tensioning continues to the desired height for releasing the DragScraper and returning it by gravity to the pit.

Operator controls digging and hauling from cab in head tower.

"the 10-yd. DragScraper is doing a wonderful job and we could not operate without it..."

Louis Chinelli, Gen. Supt.  
Redman Concrete Corp.

Redman had been trucking material at a cost of \$35,000 a year to the location where the DragScraper is now placing it. The 10-yd. Sauerman covers a pond area of 1500' by 3000' and is digging 40 ft. deeper than their previous dragline could operate.

The DragScraper digs and hauls on a 900-ft. span. It operates between a 90-ft. fixed head tower and a 40-ft. mobile tail tower which may be shifted to change the line of operation. The company's 1000-yd.-per-day batch plants and its fleet of mixers and trucks are kept busy by the steady flow of material supplied by the DragScraper.

## High Bank Digging

175 FT. HIGH—  
600-FT. HAUL...



DragScraper digs from high bank.

Overall view shows height and steepness of bank. Diagram shows details of Sauerman installation.

"I have nothing but praise for our 4-yd. Sauerman Machine. Since the DragScraper began operations in 1952, we have worked it continuously 12 hours a day..."

John D. Robertson, Gen. Supt.  
Chandler's Palos Verdes  
Sand & Gravel Co.

By working down from the top of the 175-ft. bank, the material flows ahead of the DragScraper. This provides bonus loads on each haul and substantially lessens the danger of cave-ins.

Operating cables are powered by a Sauerman three-drum electric hoist. Equipped for rapid shifting, the DragScraper can be quickly positioned to any line of operation between the two tail towers at the top of the bank and the headpost at the hopper.

The plant is the largest sand producer in the South Los Angeles area and, together with two ready-mix plants, keeps 22 ready-mix and 18 dump trucks busy.

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, the depth and plant layout. Consult Sauerman engineers about your plant. Their recommendations

will be based on fifty years of excavating machinery experience. Ask for Catalog A (DragScrapers). Sauerman News Nos. 149 and 150 describe the above installations in greater detail.

# SAUERMAN

# BROS. INC.

630 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS

CRESCENT SCRAPER • BLACKLINE and TAUTLINE CABLEWAYS • DREDGE BLOCKS

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**FOR NORTHWEST  
DIGGING ABILITY**  
*you need no greater proof!*

WHAT about shovel digging ability? What about shovel dependability? The experience of Lambert Brothers of Nashville, Tenn. is representative of Northwest owners all over the country. The business of Lambert Brothers is Rock and they know equipment. It is significant that Lambert Brothers has added eight more Northwests to their fleet in 1957. This makes some 30 Northwests that this well known Tennessee operator has bought.

Northwest shovels are *real* Rock Shovels. They bring a combination of advantages that have made them outstanding in handling heavy rock work and excavation. They make hard digging easy and easy digging easier. Machinery Bases and Machinery Side Frames are heat treated, cast steel to take the shocks of digging. The "Feather-Touch" Clutch Control makes operation easy without resorting to valves, compressors, pumps and other delicate mechanisms and yet retains the feel of the load.

The Helical Gear Drive, the Cushion Clutch, Uniform Pressure Swing Clutches and the Northwest Dual Independent Crowd not only play a part in better output but they combine to assure performance when it is needed.

*Your Northwest is always ready to go. We hear it everywhere and Northwest users will tell you so. We'd like to tell you more about Northwest advantages. Ask for a catalog on the size machine you need.*

**1957**  
**Saw 8 more**  
**NORTHWESTS**  
**in the fleet of**  
**Lambert Brothers**  
**Nashville,**  
**Tenn.**

S-50-53-5

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Chicago 3, Illinois

**NORTHWEST**

*Always  
Ready to* **GO**

**SHOVELS**  
¾ Yd. to 2½ Yd.  
Capacity

**CRANES**  
13-Ton to 50-Ton  
Capacity

**DRAGLINES**  
¾ Yd. to 3 Yd.  
Capacity

**PULLSHOVELS**  
¾ Yd. to 2½ Yd.  
Capacity

**TRUCK CRANES**  
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**AIR SPRINGS**

for maximum  
isolation of  
vibration

**NOW — Allis-Chalmers Vibrating Screens  
FLOAT ON AIR**

**N**EW cars, modern trucks and trains utilize air springs for the smoothest, best controlled ride obtainable. Now Allis-Chalmers has applied the *same type air springs to vibrating screens* to provide greatly improved screen performance.

For complete information, see your nearby A-C representative, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis. Ask for Bulletin 07B8931.



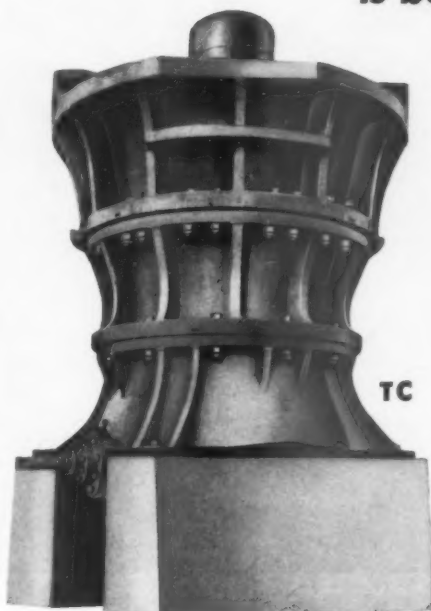
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**ALLIS-CHALMERS**

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# **EXPERIENCE**

*is built into these precision-engineered*  
**GYRATORY CRUSHERS**



**TC**



**TY**

**TC**

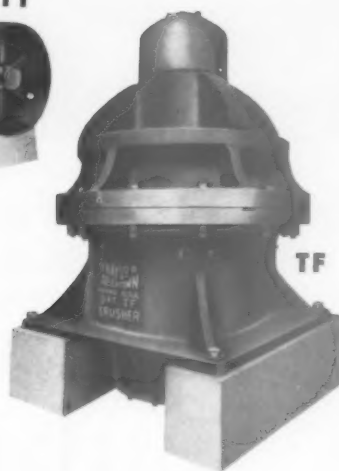
Built in six sizes with capacities ranging from 245 tons of a 2" product to 4100 tons of an 11" product.

**TY**

Built in six sizes from 1'—3" to 5'—6" with feed openings from 3" to 22".

**TF**

Fine Reduction Crusher for operators whose needs demand economic production of  $\frac{3}{16}$ " to  $1\frac{1}{4}$ " material in large capacity.



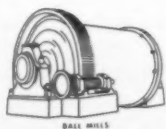
**TF**

The Traylor Type TC Gyratory Crushers feature the non-choking, self-tightening bell head and curved concaves, a Traylor original development. The Traylor patented dust seal provides a practical and efficient device for excluding dirt from the lubrication chamber. The Traylor TY and TF require less head room due to compact, simplified design. These reduction crushers also have Traylor original curved concaves and self-tightening bell heads. For the most advanced crushing machinery designed to create greater profits for the operator—write to Traylor for detailed information.

## **TRAYLOR ENGINEERING & MFG. CO.**

1064 MILL ST., ALLENTOWN, PA.

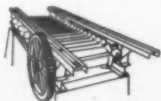
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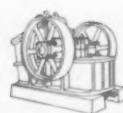
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APRON FEEDERS



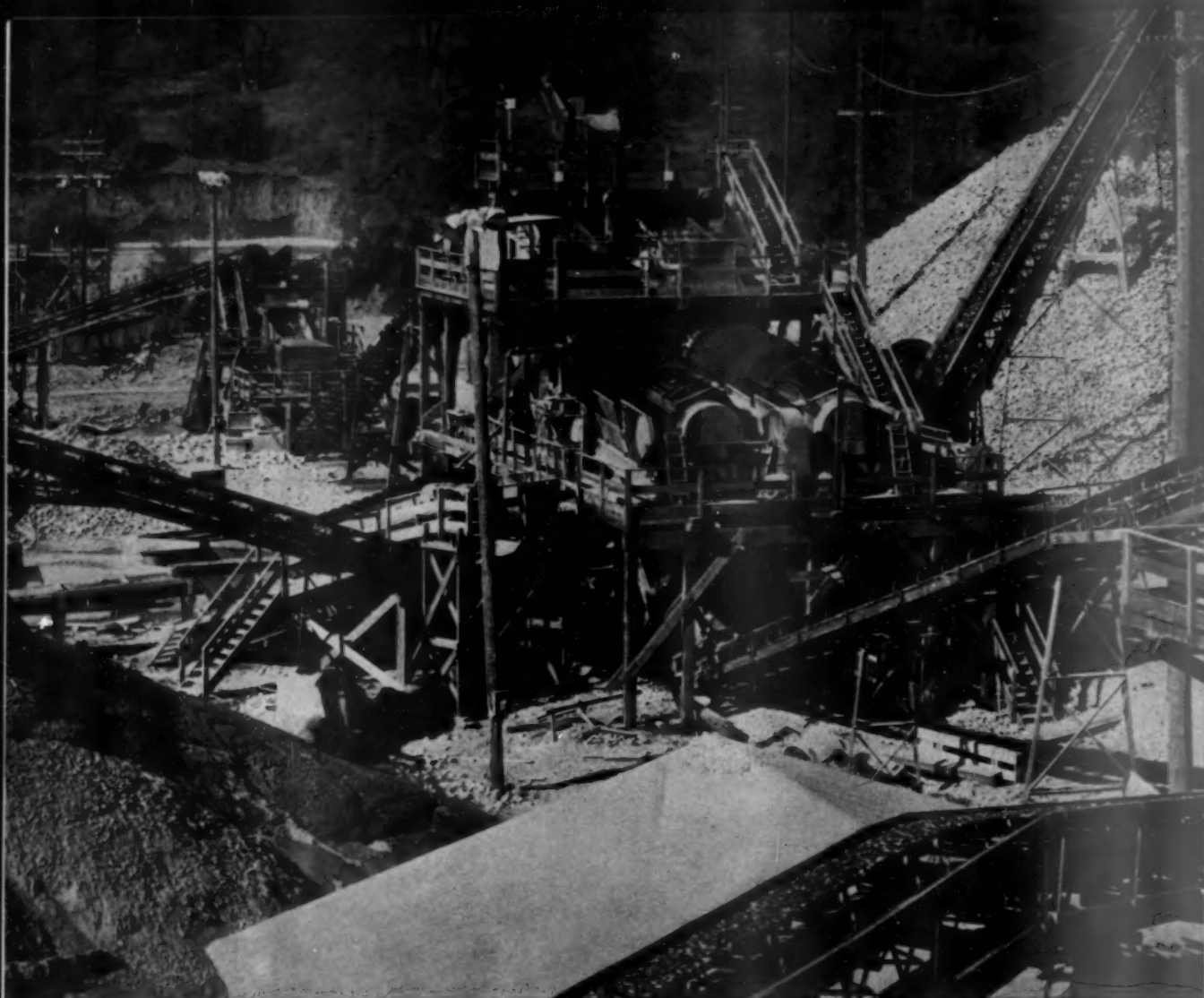
PRIMARY GYRATORY CRUSHERS



JAW CRUSHERS



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Six Texaco lubricants can solve all your major lubrication problems with the

# Texaco Simplified Lubrication Plan

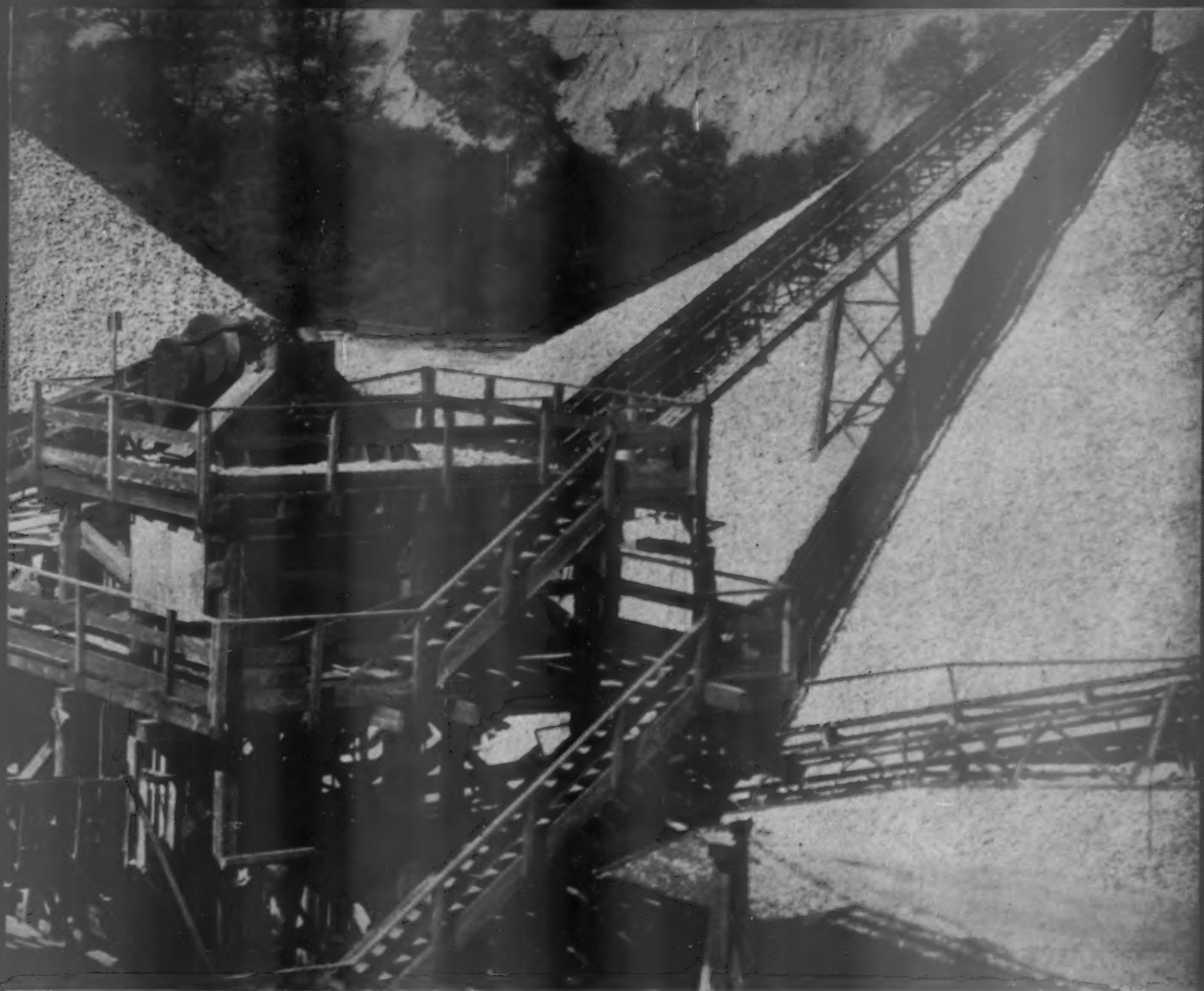
**Fewer lubricants means fewer storage, handling and inventory problems, plus complete lubrication protection.**

In a big operation like this aggregate plant, Texaco's Simplified Lubrication Plan contributes to overall efficiency by assuring that you get the *right* lubricants for all major equipment. The Texaco Simplified Lubrication Plan developed for your operation may call for as few as 6 lubri-

cants, yet they will handle all major lubrication . . . reduce storage problems, handling costs, and minimize the chance of using the wrong lubricant for the job. And the Texaco Lubrication Engineer will make sure that the lubricants you use are tailored to your operation. It all adds up to equipment that's more efficient—and systematic lubrication that's simple, time-saving and economical.

Here are some of the products that can handle





all your major lubricating problems:

**Texaco Ursa Oil Heavy Duty**, fully detergent and dispersive, to keep heavy duty gasoline and diesel engines clean and economical.

**Texaco Marfak**, has a wide temperature range, high resistance to shock loads, seals out dust and dirt, prevents rust.

**Texaco Regal Oil R&O** for air compressors and hydraulic systems, a high-grade lubricant fortified with rust and oxidation inhibitors; assures trouble-free operation.

**Texaco Universal Gear Lubricant EP**, assures long life for transmissions and differentials.

**Texaco Track Roll Lubricant**, specifically designed to protect rollers against rust and wear.

**Texaco Rock Drill Lubricant EP** for longer drill life

and full protection against rust, whether drills are running or idle.

Your local Texaco Lubrication Engineer can give you complete details on the Simplified Lubrication Plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



**LUBRICATION IS A MAJOR FACTOR IN COST CONTROL**

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

# "Our Ford Tandems outlast

*Says David Courtney, President  
Courtney and Plummer, Inc., Neenah, Wis.*



**"We've got '49 model Fords with over 400,000 hard miles on 'em . . . and they're still going strong!"**

"Our Ford tandem dump trucks carry 8 yards of gravel and average about 50,000 miles per year. We've never had such good engine life, as with these Ford Heavy Duty V-8's.

"We started using Ford trucks with a model 'A' for dump service in 1930, and bought our first Ford heavy-duty job in 1949. After 125,000 miles of outstanding performance this F-8 was still running real good, so we added more Fords to our fleet. They keep working, year after year, with a minimum amount of upkeep . . . and that's really something in this business.

"With the addition of our four new '58s, we now have fifty-five Ford trucks and are very satisfied. And we like the fine service we get from our Ford Dealer. They always keep a complete stock of parts, so we don't have to carry any, and they stand behind what they sell 100%.

"I guess the best proof of how Ford trucks perform is the fact *we keep on buying more!* We just took delivery on a T-850 Extra Heavy with Super Duty V-8, and have several more on order for our transit-mix business."

**Official registrations show AMERICAN BUSINESS BUYS MORE FORD TRUCKS THAN ANY OTHER MAKE!**

# anything we've ever owned"



Taking big loads and all roads in stride, these Ford T-800 tandem dumps have built an outstanding reputation for performance and durability. Shown loaded with 8 yards of gravel, they daily deliver and dump tons of sand or gravel.

New '58 T-850 with 401-cu. in. Super Duty V-8 and front-end power take-off mixer drive... handles 6-yard loads legally.



**Bring extra savings  
to your business...  
make your next  
truck a FORD!**

Official registrations for 1957 show that *American business buys more Ford trucks than any other make.* There are many reasons for this popularity...many reasons for you to make your next truck a Ford!

Ford trucks are your best buy! Ford's initial costs are *low* and resale value is traditionally high. The modern Ford Styleside pickups are the lowest-priced models available with full cab-wide body... giving you 23% more loadspace than any traditional type pickup box.

Only Ford offers the economy of Short Stroke power in all engines, Six or V-8. And Ford's Heavy Duty V-8's offer new, advanced durability features. The modern Ford Six, available in Light and Medium Duty F- and P-Series trucks, has a new carburetor that gives you up to 10% greater gas mileage. It's plenty peppy, too, with more horsepower per cubic inch than any other six in its class.

Ford's rugged cab and chassis construction means these new '58s are built to last. Every Ford has safety glass in every window. All this plus the proven fact that Ford trucks last longer adds up to America's No. 1 truck value. See your local Ford Dealer for the latest in '58 trucks or the best in A-1 used trucks.

## FORD TRUCKS COST LESS

**LESS TO OWN... LESS TO RUN... LAST LONGER, TOO!**

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ROCK PRODUCTS, July, 1958

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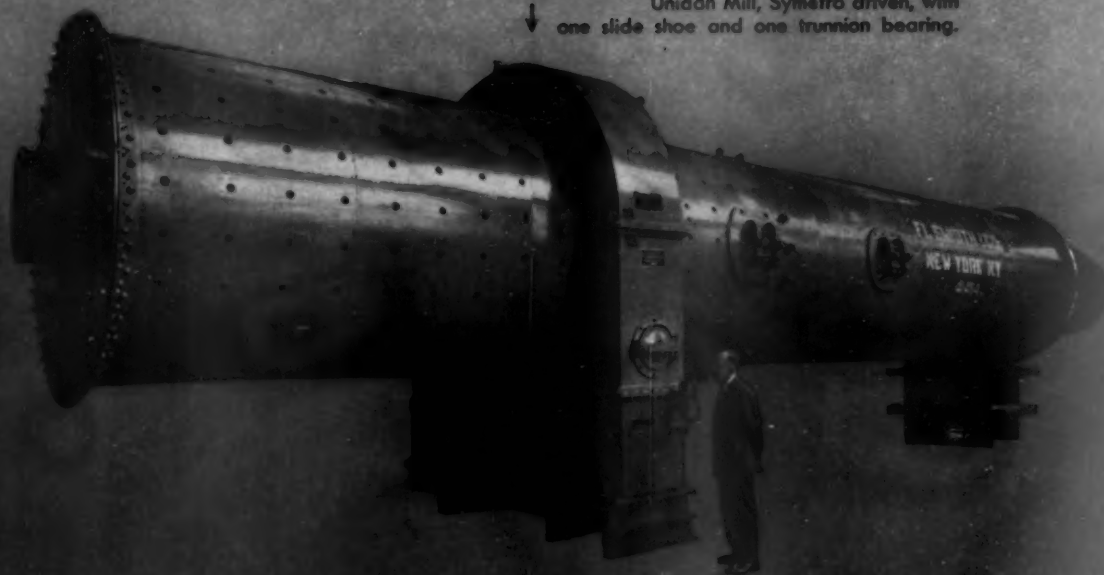


# SMIDTH

## Grinding Mills

Ball Mills and multi-compartment Unidan Mills for wet and dry, open and closed circuit grinding and airswept Tirax Mills for simultaneous drying and grinding. Auxiliary equipment for mills. Special features include the Smidth slide shoe bearing and the Symetro Drive.

↓ Unidan Mill, Symetro driven, with one slide shoe and one trunnion bearing.



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# What's Happening

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IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

July, 1958

**Blast furnace slag, byproduct of steel production,** has been in short supply as a result of production cuts in that industry. This has caused some slag distributors to dig into disposal piles of the material to meet the demand. Nationwide slag sales have climbed to a current level of about 35 million tons per year from about 30 million tons five years ago.

**A process which promises to make production of silica fibers practical** has been developed at Bjorksten Research Laboratories. In a continuous process, quartz can be drawn into vitreous silica fibers 20 microns thick. When coated with metal, perhaps aluminum, and then felted or matted together, the fibers make a product which is strong, lightweight and heat resistant. A long-range possibility, suggests **Chemical and Engineering News**, is a fabric made of silica. Protective clothing made of aluminum coated fibers would be extremely strong and heat resistant.

**Limestone exploration has been given an assist by IBM machines** which speedily sort and record punch-card data in a form for visual inspection or for use in preparing maps. In an experiment reported by Geological Society of America, data for each of more than 600 samples were recorded on IBM punched cards. Machines sorted the cards, assigning and recording sequence numbers. Printed lists show the data arranged by sample number and frequency distribution of MgO in relation to each of the chemical components, to stratigraphic position, to structural distribution and to the field traverse section.

**Long-distance trucking is being tried** to see whether it can pare coal transportation costs. Cleveland Electric Illuminating Co. began last year to truck coal 80 miles from New Philadelphia, Ohio, coal fields to its power plant on Lake Erie. Each rig—a tractor and two trailers, made mostly of aluminum—makes three round trips per day, carrying a legal 27-ton payload. Six of the new trucks have been in use since the first of the year. Thirty-six more would be needed to take over the full 1-million ton yearly trucking chore, and might be expected to result in a \$1-million savings yearly. Incidentally, the 108-mile pipeline transporting a coal-water slurry from eastern Ohio to the CEI plant has begun to carry a full commercial load.

**During April, \$3.7 billion was spent for new construction put in place.** This was up \$328 million from March, and compared with an April, 1957, figure of slightly more than \$3.6 billion. Also during April, there was an upturn in construction contract awards, welcome after four months of sharp drops from year-earlier levels. F. W. Dodge Corp. listed awards as four percent higher than in April, 1957. Figures for homebuilding in April, supplied by the Bureau of Labor Statistics, also showed an increase: 90,700 housing starts represented a seasonally adjusted annual starting rate of 950,000, eight percent above the March figure.

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## WHAT'S HAPPENING

---

**In the two weeks following President Eisenhower's signing of the new highway bill in mid-April, the states received \$8.4 million of emergency highway funds to open the way for work on 212 miles of primary, secondary and urban roads. States authorized \$3.2 million of their own funds, bringing the total authorized for the 212 miles of roadway to \$11.6 million. According to the Department of Commerce, a total of \$3.5 billion was authorized or actually spent on the 41,000-mile interstate highway network up to April 30.**

**Developed in England as a replacement for mica, a strategic raw material in the country's stockpile, is a new material called "mica paper." It is made with industrial scrap mica and can be used as an insulator in high-temperature capacitors for supersonic aircraft, guided missiles and satellites. It is said to have performed as well as or better than natural mica as a capacitor dielectric in extensive tests.**

**Uses for portland cement seemingly have not been exhausted. A tip for nurserymen has come from the Beltsville, Md., laboratory of the United States Department of Agriculture, via Dr. Floyd Smith. To control slugs in your garden, says Dr. Smith, mix metaldehyde and chlordane with portland cement, let harden, then break into small pieces for scattering about in plant beds. The cement keeps the metaldehyde from being destroyed by moisture, making it a long-lasting and effective slug bait.**

**A 22-wheeled "Centipede" truck will be run over 9,300 miles of highways by the Michigan State Highway Department to measure their traffic-carrying ability. Having recording wheels in the center and 16 small wheels front and rear, the truck moves four to five miles per hour. Road irregularities as small as 1/32 in. are recorded on graphs showing soil, drainage and construction. A camera snaps road-slab crack patterns.**

**To spur home sales, a Park Forest, Ill., contractor gave \$1,000 bank accounts with each purchase, and response was sensational. The offer made 147 sales in one week and drew 8,000 lookers. The firm intends to build a record 1,000 dwellings this year.**

**An Eskimo family will put a new type of construction to the test by living in it. At Frobisher Bay, Baffin Island, two 16 x 34-ft. buildings have been built to determine whether asbestos is the answer to problems in sub-arctic construction. In their erection, plastic foam panels faced with asbestos board—a type of sandwich panel—were used.**

**An interchange of information between European and U. S. firms is resulting from a program sponsored by 20 noncompetitive American corporations. In the two-year program, the European Technical Observation Group reports on European industry, technology and science to the sponsors. Its staff of scientists and engineers covers Western Europe, visiting plants, laboratories, scientific meetings and trade fairs. It reports current literature, patents and theses. Several of the sponsors will extend the program by entering licensing or information-interchange arrangements with their counterparts in Europe.**

**The editors**

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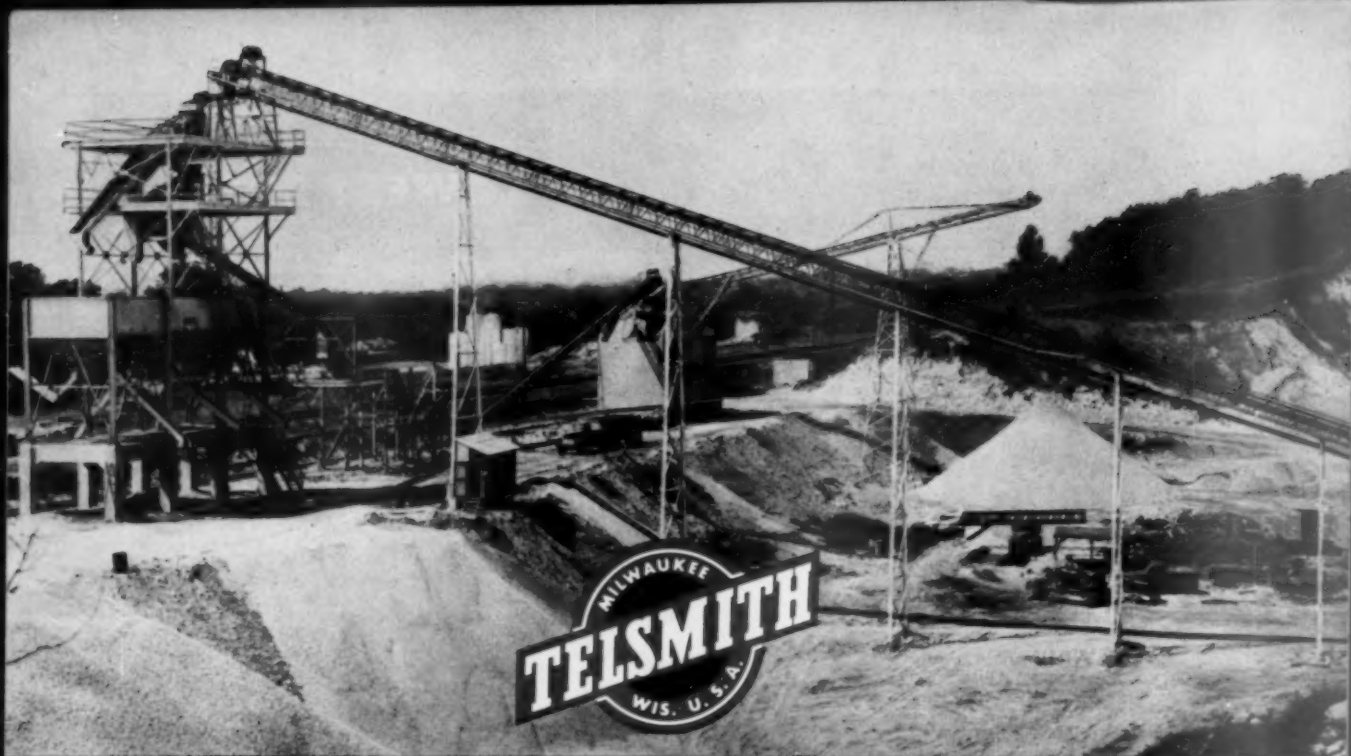
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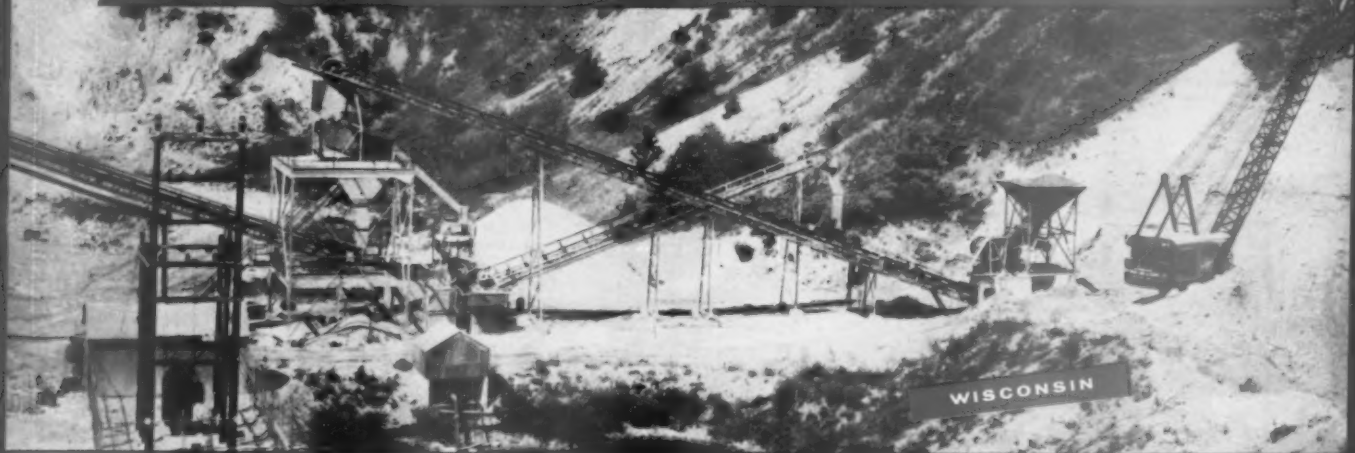
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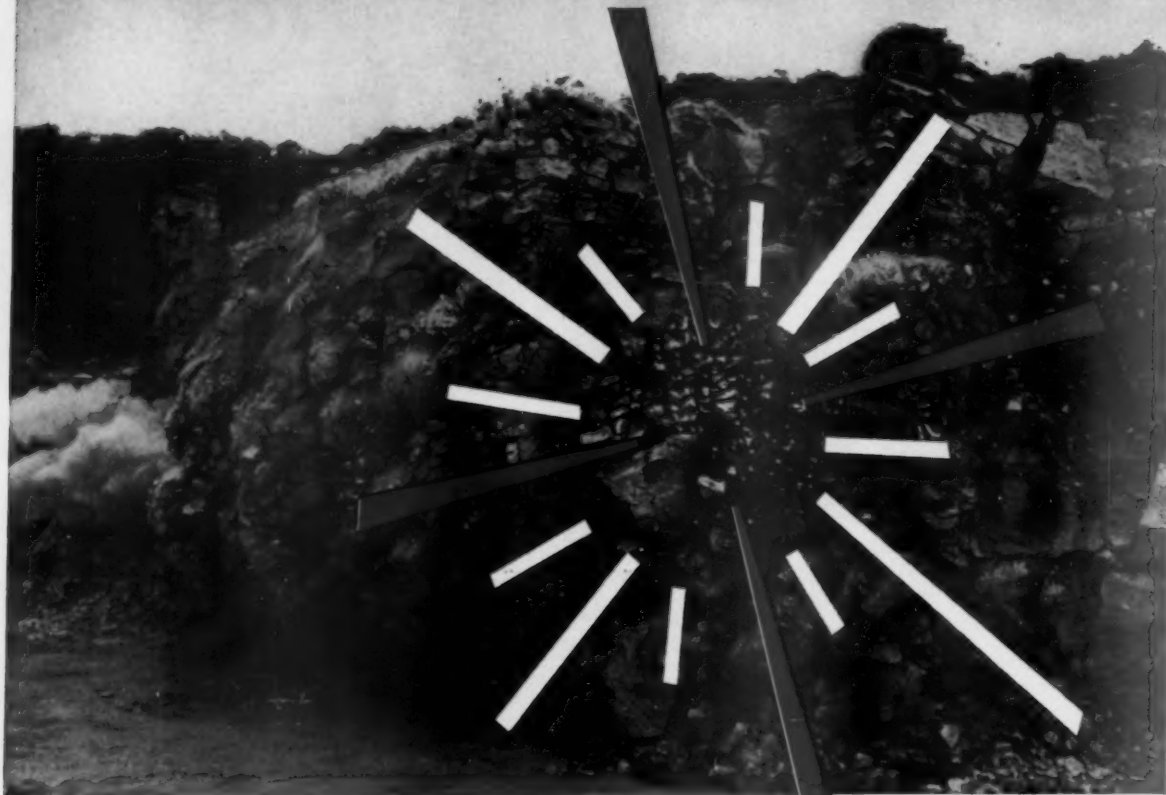
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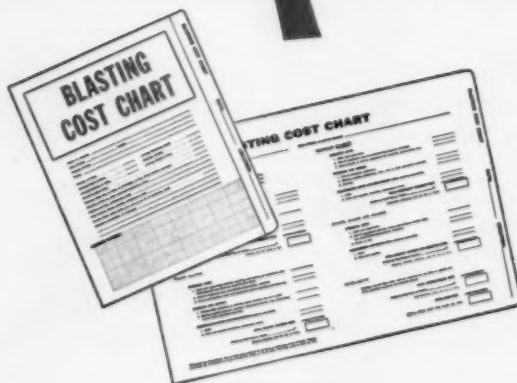
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## EDITOR'S PAGE

George C. Lindsay, Editor

### Wanted: more education on our economy

**E**CONOMIC FACTS OF LIFE are your strongest argument across the bargaining table. Yet, there is a general lack of education on money and on the national economy. Because of it, collective bargaining results have contributed to dollar inflation—our worst future enemy. You, as business men, have a big responsibility to promote a program for better understanding of how our economy works, and why.

William A. McDonnell, president of The Chamber of Commerce of the United States and a St. Louis, Mo. banker of renown, had some points to make on the subject that we want to pass on to you.

Labor leaders insist that the best way to cure the recession is to increase purchasing power. The surest way to that goal, they say, is to increase wages. That's labor's viewpoint, but it's all wrong, says Mr. McDonnell. He insists—and we think he's right—that a rise in purchasing power is a cost to somebody, unless it comes from a jump in productivity. He adds that the surest way to cure the recession is to get prices down, if you're interested.

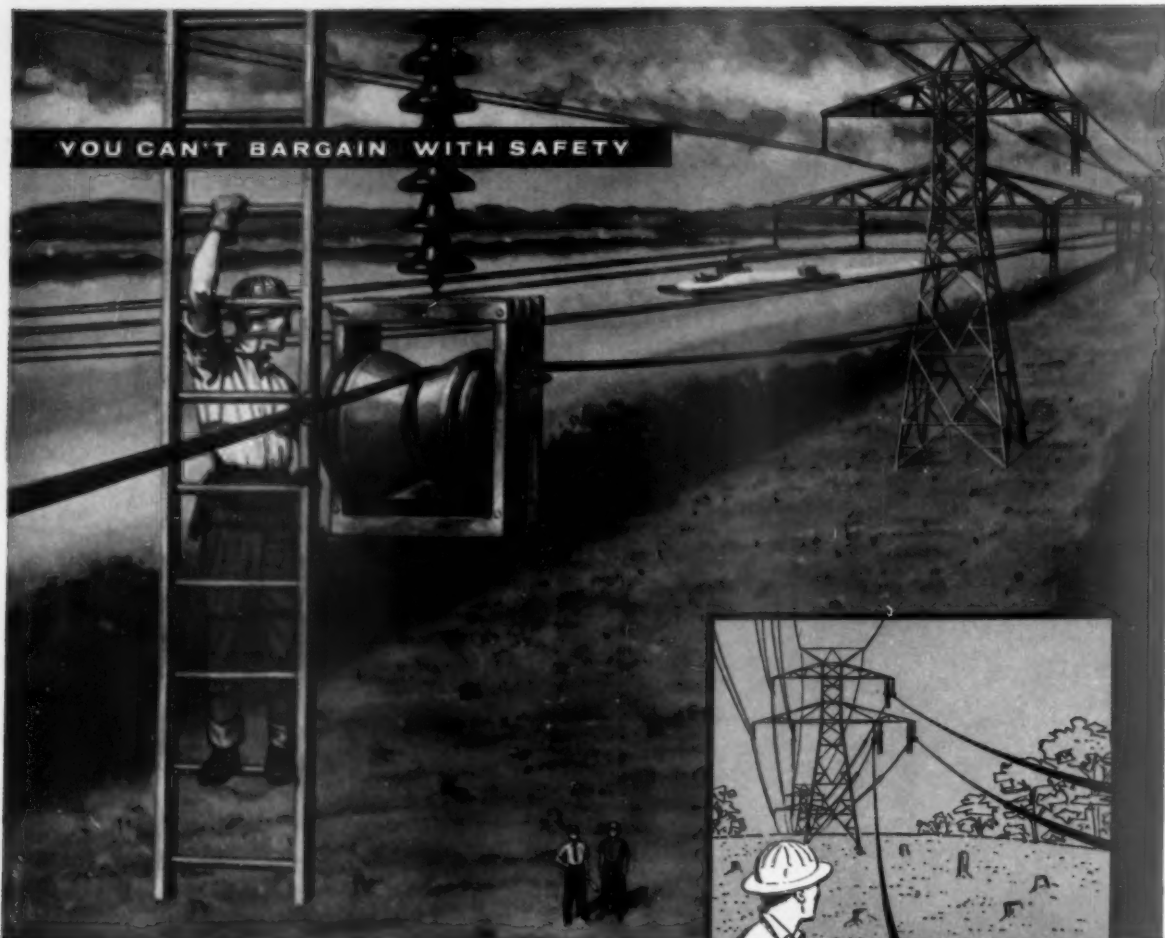
Look at it this way: a wage increase to all organized labor invariably results in a price jump. The consumer pays. Since union labor represents only a fraction of our total employed, the rest of the workers are faced with a harder job to meet expenses. Their dollar buys less, which means inflation—unless a compensating increase in total productivity is effected.

Labor insists, says McDonnell, that corporations are taking a greater share of the economy in profits. Thus, they can and should agree to negotiate more into labor's pocket. The 1948-1957 record shows this to be untrue. As a percent of national income, corporations' share dropped from 9 or 10 during that period, while wages rose from 62 to 69. The argument is false. Either labor doesn't know the facts or they are indifferent to them—but they shouldn't be if we are to steer clear of inflation ahead.

What is inflation? Look at the record France has had with money—and beware! During War I a 1,000-franc note equalled 200 U. S. dollars—a month's pay for an Army Captain. Today, it's worth \$2.30. That's inflation.

It can't happen here? Our 1958 dollar is worth less than half of the 1939 dollar. If we follow France's experience, a \$100 Social Security check will buy 2 pounds of hamburger by the year 2000.

Some way, somehow, people must learn that inflation and the economic manipulations that cause it are dangerous to our future welfare—yes, even to labor itself. We suggest you start a program now to inform, to educate, your people on what money is and how it works in our economy—so they can get those facts across the bargaining table before it's too late.



Stringing conductors on towers carrying a live 330,000 volt circuit is a tough job. Hoosier Engineering Company of Columbus, Ohio, does it by threading conductors up to 1 3/4" through a tension machine and pulling them over sheaves on the tower arms with 9000 foot lengths of Wickwire Wire Rope. On jobs like this, where men's lives are at stake . . .

## rope failure can be fatal

Whether you're stringing power lines, pulling drill pipe, or handling other hazardous hoisting jobs—don't bargain with safety. "Bargain" wire rope can cause more trouble and expense than you expect. Buy wire rope on the basis of *quality* . . . buy Wickwire Rope.

**For extra strength—buy Wickwire's Double Gray  
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## Pulverized calcite merely a cement adulterant?

SEVERAL YEARS AGO in one of our issues we gave considerable publicity to the discovery of a Norwegian engineer, Arne Daniels, that a certain pulverized calcite, which he trademarked by the name of "Aktivitt," when blended with portland cement, gave to the resulting concrete some alleged very desirable qualities. There seemed to be quite a weight of evidence from experiments in the Scandinavian countries that his claim had real merit. Our recollection is (and we are depending purely on memory) that under the auspices of the American Concrete Institute some tests were made in this country, and the conclusion was drawn that a pulverized calcite blended with cement resulted in a product inferior to straight portland cement—that the pulverized calcite was merely an adulterant, and that it decreased the strength of the concrete without any advantageous results.

Recently we received a letter from Mr. Daniels to the effect that he was soon to be visiting in this country; and about the time this article goes to press, he should be in Chicago, where we hope to interview him. Along with his letter he sent much new data to support his claims for the superior qualities of Aktivitt concrete. All the experience seems to have been in Norway, or possibly other Scandinavian countries, and the only calcite used appears to have come from a single source there. It may be, therefore, that this particular calcite has some special property, or properties, physical or chemical, that other calcites do not have. This is entirely possible for there are different natural isotopes of all three of the elements of which calcite or calcium carbonate is composed.

Take first the element carbon, which is found in nature in the form of two stable isotopes, designated  $^{12}\text{C}$  and  $^{13}\text{C}$ , which means that the normal

element C, the sixth in the periodic system, is credited there with six protons, six neutrons and six electrons, and an atomic weight of 12.01. However, it sometimes has an extra neutron and an atomic weight of 13—that is  $^{13}\text{C}$ . Generally we assume that the chemical characteristics of an element are the same in all its various isotopes. But this is not strictly so, especially in the case of the lighter elements, of which carbon is one. The fact that the average atomic weight of carbon is 12.01 instead of 12.0, therefore, means that perhaps some 10 percent of natural carbon is  $^{13}\text{C}$ . The carbonate rocks are a principal source of carbon in nature, and the most plentiful carbonate rock is, of course, limestone. The ratio of  $^{12}\text{C}$  to  $^{13}\text{C}$  in the calcite of limestones varies from about 88.7 to 89.9; or there can be over one percent of difference as between two ordinary calcites.

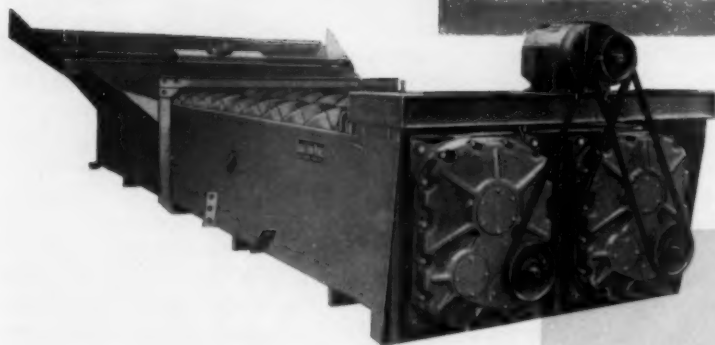
The variation, apparently, has some relation to the age and method of formation of the calcite. There is an unstable isotope of carbon,  $^{14}\text{C}$  in living matter, which loses a neutron by decay, and hence the farther removed in age from living matter the less  $^{14}\text{C}$  is present. This method is used to estimate the age of wood, bones, etc. It is possible that some natural process also turns  $^{13}\text{C}$  into  $^{12}\text{C}$ , but this is difficult to determine since both are stable under ordinary natural conditions. However, these data do give a suggestion of why carbon is so active in living or organic matter, and inactive in mineral form, and why possibly one calcite may react differently with silica or the silicates in the one case than in another.

Calcite is  $\text{CaCO}_3$ , so oxygen is also an important constituent. There are three stable isotopes of oxygen in nature,  $^{16}\text{O}$ ,  $^{17}\text{O}$ ,  $^{18}\text{O}$ . About 99.7 percent of the oxygen in air and water is  $^{16}\text{O}$ , most of the rest is  $^{18}\text{O}$ . Moreover, oxygen which constitutes almost 46.5 percent, by weight of the igneous rocks (the original Earth's crust), is the most important rock-making element. Apparently, although much research remains to be done, about half of the oxygen in such rocks is  $^{18}\text{O}$ , while, as already noted,

Please turn to page 131

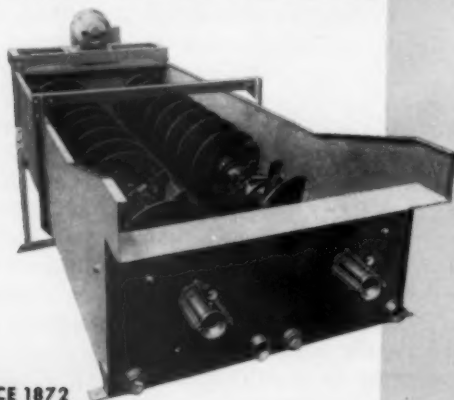
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After thorough pilot plant tests and in the field, Eagle engineers developed a drive that will cut maintenance costs and save you money. It also provides easily varied screw speed to meet various mesh sand specifications.

The new drive is totally enclosed and runs in an oil bath as does an auto transmission.



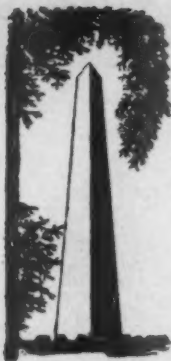
Eagle pioneered the screw washer and every major design improvement since then. This new drive is another "feather in Eagle's cap" and means greater savings for aggregate producers. Send for Catalog 58.



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# Washington Letter

Edgar Poe

## Construction In upswing

With summer here, construction news is of marked importance to the national economy. Although factory construction is down, public nonresidential building is moving ahead of the corresponding period of a year ago. There is a tremendous building program in new skyscraper office buildings on the horizon.

New home construction is picking up. April starts totaled 95,000, slightly above the corresponding month of 1957. It was because of the pickup in construction that President Eisenhower asked Congress for an additional \$4 billion for the FHA mortgage insurance program to keep pace.

New construction of all kinds in May involved an estimated outlay of \$4 billion. The Bureau of Public Roads says at the start of the new fiscal year (July 1) there were \$9.8 billion road programs (all types) in progress. BPR said the total figure represents the costs of all projects programmed, but not finished.

Before the frost falls on the pumpkin next autumn there will have been 918 new post office buildings either being constructed or under contract. Total cost will involve some \$50 million. Obviously most of them will be in smaller communities, but the construction will be a stimulant to the economy of those communities.

## Vote no Funds for Schools

The House Education and Labor Committee, as a result of a 15-to-15 vote, has killed for the 1958 session of Congress the administration-proposed classroom construction program. Under the bill, the federal government would have matched the states on a 50-50 basis. Some members of Congress maintain that the states are financially better off than Uncle Sam. Therefore, such a program should be left up to the individual states.

## Carriers Must Deliver

The Interstate Commerce Commission, in an important ruling, declares that common carriers, because of their obligations to the public, may not bargain away their rights. A group of truck and rail carriers advised the ICC they could not be responsible for pickup and delivery service during strikes, riots, picketing and other labor disputes. Whereupon, the federal regulatory agency held that such an arrangement was illegal.

The ICC contended that the mere existence of a strike or picketing does not necessarily prevent the performance of pickup and delivery service. Earlier in the year, the agency held that operators of trucks could not concur with a union to refuse to handle any goods or materials regarded by the unions as "hot cargo." The ICC also ruled in that case common carriers could not bargain away obligations to serve the public.

## Highway Material Statistics

The American Road Builders' Association reports that stepped-up orders placed in 1958 by successful contractors for materials, services and equipment largely for delivery in 1959 (calendar year) will include these major items: Fabricated steel, 290,000 tons; reinforcing steel, 200,000 tons; cement, 15 million barrels; bituminous material, 1.6 million tons; additional construction equipment added to the contractor fleets, \$175 million.

Major General L. W. Prentiss (ret.), executive vice president of the ARBA, says no other category of public works is as ready as highway construction to move in and do an efficient job on a carefully planned long-range program.

A billion dollars of highway expenditures provides 102,000,000 manhours of on-site work and 126,000,000 manhours of off-site work to supply needed materials, like cement and other materials supplies, and equipment and services.

The highway system of the United States today consists of 3,400,000 miles of roads, streets and highways. About 775,000 miles, or less than 25



percent, make up the federal aid system with one-third of these miles included in the primary system and two-thirds in the secondary system. The 41,000 miles of interstate highways will be part of the primary system.

**Microwave  
Ruling  
Unlikely**

Policy changes in federal microwave frequency allocations that would help truck operators are unlikely before 1959. The Federal Communications Commission is expected to propose some provisions in the applicable rules this year. However, the prospect for truckers is unfavorable. A pilot application for microwave rights has been pending before FCC since 1954. Trucks hauling cement for a project in the field, or those hauling sand and gravel, for instance, could use microwave to advantage in communication with the central office.

**Questions  
Steel  
Markup**

Senator Estes Kefauver's Anti-Trust Subcommittee has issued a majority report declaring that the steel companies should be reducing their prices, rather than increasing them. He maintains that hearings conducted by his committee last year convinced him steel companies should not have raised their prices in excess of \$3 a ton, whereas the price increase amounted to \$7. The Tennessean maintains that he is going to call on a steel company that puts a new price increase in effect to explain why.

**Demand  
Tax  
Repeal**

Demands for repeal or suspension of the wartime-enacted transportation excise taxes are growing louder and louder. This tax is another example of a so-called "temporary" impost. Once it gets on the statute books, those collecting it make every effort to keep it. The U. S. Chamber of Commerce has come out in favor of repeal of the excise transportation tax.

**COPE  
Campaigns**

The AFL-CIO's political action organization is now called COPE (Committee on Political Education). It is campaigning in 16 states to elect senators friendly to labor. Here in the nation's capital there appears to be little doubt that labor unions and officials are making a concerted effort to take over control of the Democratic party. They are now working in the open, and no longer are directing their activities from behind stage.

**Probe  
Railroads'  
Troubles**

The Senate Subcommittee on Surface Transportation, after long hearings on the plight of the declining railroads, cites four specific reasons. They have intense competition from the newer methods, including private automobiles, airplanes and the building of modern highways on which move millions of trucks and buses; government assistance in building highways and airports and toll-free waterways; overregulation of the railroads by the Interstate Commerce Commission, plus many state regulatory agencies. The fourth reason was described as failure of railroad management to recognize changing conditions and compete aggressively for business.

**Housing  
For the  
Military**

The new military public works construction program will take a large amount of rock products. The military housing units will be the largest users. Military construction spending (a portion will be abroad) for the new fiscal year starting July 1 will approach \$2 billion.

**In the  
Swim**

Rock products industries are interested in the rise in private swimming pool construction in this country. The American Society of Planning Officials reports that nearly 200,000 private swimming pools will be in operation this summer. The total number is 50 times greater than in 1957.

The number of private pools is growing at such a clip that some cities have passed ordinances to regulate swimming to avoid disturbing the neighbors after 10 p.m. and before 6 a.m.

**Airport  
Program  
Passed**

Congress has passed the federal-aid airport program through fiscal 1963. The authorizations will clear the way for construction of more airport facilities in the approaching commercial jet plane age. Meantime, some cities are apprehensive of what the jet era is going to bring with its loud noises. The United States Court of Claims awarded \$65,000 in damages to a Savannah, Ga., housing firm for nuisance of jet plane noise from a nearby United States Air Force Base. The recipient company, Highland Park, Inc., maintained the jets made such deafening noise it abandoned its housing development, leaving it with 136 unsalable lots.

END





This Model TD Rear Dump Euclid offers a 10-speed Fuller 10-F-1220 Transmission.



A 5-speed Fuller 5-F-1220 Transmission gives rugged dependability to this Euclid R-18 Rear Dump Truck.



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# How would you decide?

A roundup of actual day-to-day in-plant problems  
and how they were handled by management men

### Can foreman suspend careless employee without warning?

*What Happened:*

**K**NOTT WAS A maintenance repair man. One day he was assigned to fix a pump. Because he failed to tighten two bolts, oil was squirted over the work area. When the foreman discovered what had caused this situation,

1. The contract calls for a warning notice on first offenses.
2. Others had been guilty of similar offenses, and not laid off.

The company answered:

1. The contract gives us the right of suspension without warning in cases of gross carelessness.



he immediately suspended Knott for two days. Knott demanded back pay because he felt he did not deserve the penalty for the following reasons:

Each incident given in this department is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to Rock Products.

2. The oil could have seriously injured other employees. That's gross carelessness enough for us.
3. We admit that we didn't discipline others in the past for similar carelessness. But that doesn't mean we gave up our right to.

Was the company:  
Right? ☐ Wrong? ☐

*What Arbitrator Lennard ruled:*

"The amount of care that can be reasonably required of an employee is greater where his own safety and the safety of others depends upon such care, (than could be reasonably required in the absence of great danger). Maximum diligence can be reasonably required of an employee where human life is at stake: even a little bit less than maximum diligence in such a case may be gross carelessness. If the company did not impose discipline in previous serious incidents, it did not establish a precedent or past practice. I find the lay-off of Knott to have been proper."

### Can an employee be disciplined twice for the same offense?

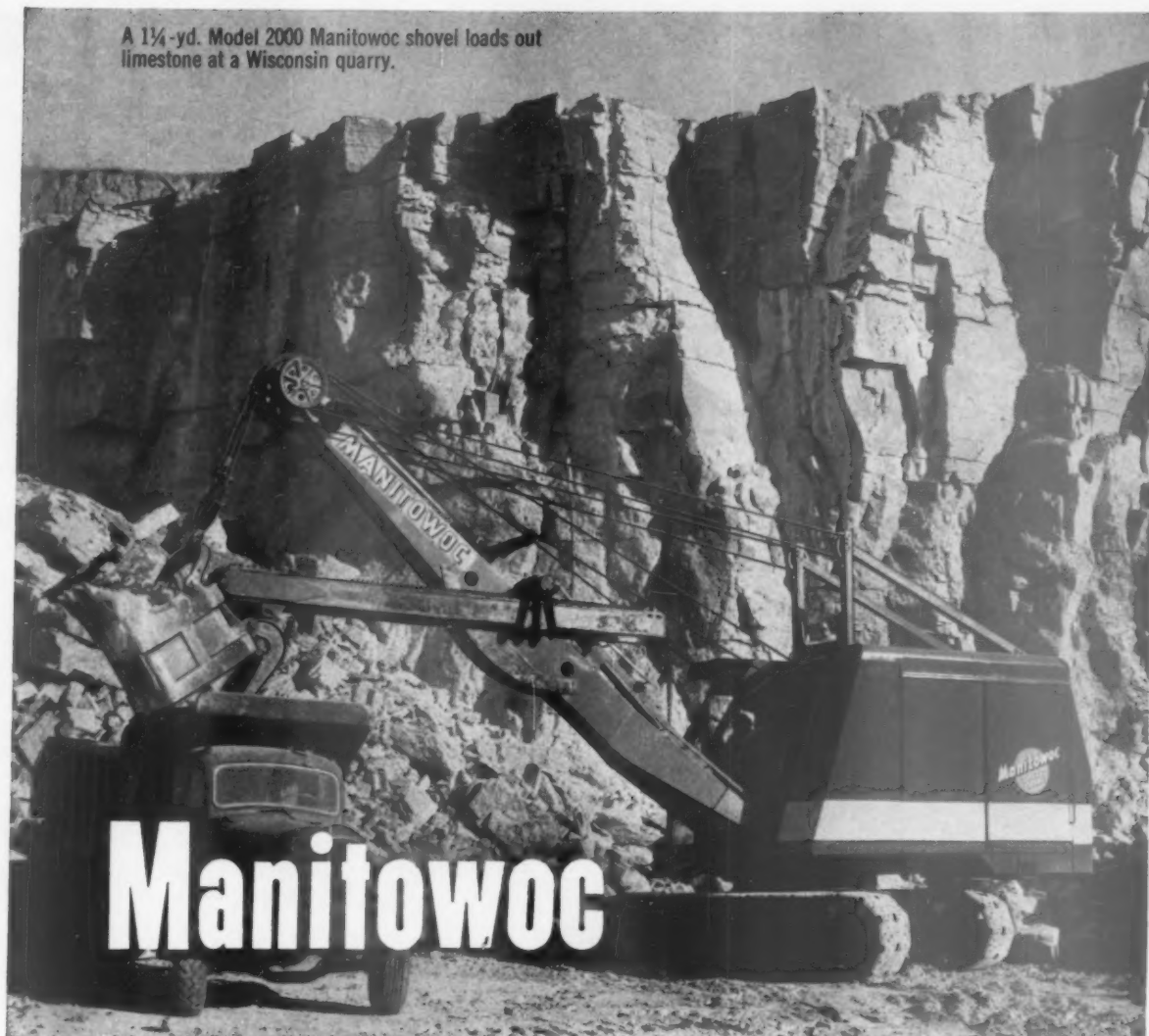
*What Happened:*

**F**OR OVER A YEAR Thompson and Gossett worked side by side but they never got along with each other. Frequently the supervisor heard them exchange heated words and curses. The foreman tried to iron things out between the antagonists and for a while things went well. Then disagreements flared up again, and one day Thompson approached Gossett in the street with an 18-in. hickory stick. A fight started, but it was quickly broken up by a third employee. When the supervisor heard what had happened, he disciplined both men with a five-day layoff, for fighting.

Meanwhile, Gossett swore out a warrant against Thompson. The case was tried in court and Thompson was convicted of assault and battery and fined

(Continued on page 33)

A 1¼-yd. Model 2000 Manitowoc shovel loads out limestone at a Wisconsin quarry.



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**BIGGER BITES, FASTER CYCLE,  
PRECISE CONTROL increase  
output in any pit**

Rugged Manitowoc rock shovels consistently outperform other units of the same capacity because they are specifically engineered to withstand the heavy pounding of tough quarry digging. Even working in the hardest materials, Manitowoc's faster cycle speed steps up production, keeps haul units rolling. Speed that is achieved through Manitowoc's simplified design delivers power only to the operating function and eliminates any power loss through non-operating gears so that the full power is directed to the dipper. That's why Manitowocs always come up with a full dipper after every bite. Positive swing braking assures the

quick, sure control of the load that is needed for fast, accurate spotting.

To all of these rugged features, add the advantages of Manitowoc power and solid stability, and the result is a full line of rock shovels that offer the best combination of speed and stamina in the industry. For complete information on the Manitowoc shovel that will best meet the requirements of your quarry or pit, contact your Manitowoc distributor soon.

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SHOVELS 1-5½-YD.

**Manitowoc**

CRANES 20-100 TON



Big 64 square-foot body opening permits loading Dumptor over the side or either end. This saves spotting time, reduces spillage — increases haul production. Dumptor is quickly loaded by shovel, dragline, clamshell crane, or front-end loader.



One-second gravity-dump speeds haul cycles. Dumptor has no troublesome body hoist, no hoist maintenance. Gravity-dump never balks, and never wears out.



On the haul Dumptor® travels forward or backward in 3 identical speed ranges — no need to turn. Its fast shuttle speeds offer a big production advantage. Every turn saved cuts 15 seconds off cycle time.



**With Koehring  
Dumptor you get**

## **A BIG TARGET for FAST LOADING**

In mine or quarry work, an easy-to-load hauling unit steps up output of the loader, reduces spillage, adds extra trips to daily production. Wide-flared body of 6-yard Dumptor provides a big, square target — 64 square feet, to be exact — for loading over the sides or either end.

On the haul, heavy-duty Dumptor has plenty of tractive power. There's over 6 H.P. for every ton of loaded weight. It accelerates fast, pulls through soft ground with less shifting, can climb grades up to 24% fully loaded. With the same high speeds in either direction, fast-shuttling Dumptor travels round trip without loss of time for turning.

Dump action is simple and trouble-free. Operator trips a latch, and gravity dumps the load in *one second*. In sticky materials, free-swinging "kick-out" pan breaks load suction for fast, clean dump. When hauling rock, pan is bolted to floor of dump body — adds an extra ½-inch layer of steel protection.

Dumptor also has a ton of strength for every ton of payload capacity. Sides and ends of body are rib-reinforced. Double-plate bottom is lined with multiple steel beams. Chassis is heavily trussed. Your Koehring distributor has more information that will interest you. See him today, or write us for new Dumptor catalog.

**KOEHRING**

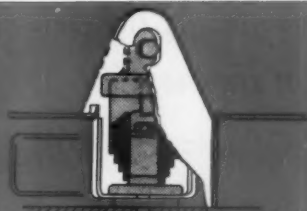
DIVISION OF KOEHRING COMPANY

MILWAUKEE 16,



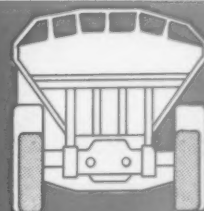
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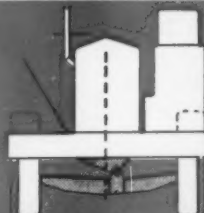
**HEAVY-DUTY SHOCK-ABSORBER**

Koehring Dumptor has a heavy, shock-absorbing, volute snubber — mounted between main frame and steering axle. No leaf springs. Big shock-absorbing drive tires eliminate springs and spring maintenance on drive axle.



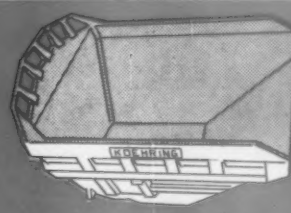
**TIRES TRACK IN DIRECT LINE**

Wide, heavy steering axle puts Dumptor steer wheels in line with drive wheels. Tires track in the same path. There's less rolling resistance, better traction in soft ground, on loose stockpiles and over rough haul roads.



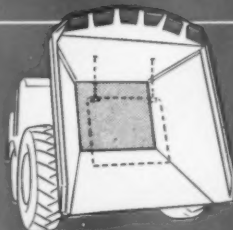
**OFF-SET PIVOT ON AXLE**

Pivot point on steering axle is offset from center line 3¼" toward operator side of Dumptor. There's no sag, even with unbalanced loads. Steering axle oscillates up to 21", helps keep twisting strains out of main frame.



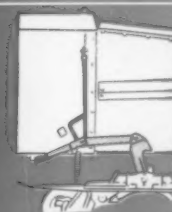
**STREAMLINED ALL-STEEL BODY**

There are no bulges or ledges inside the body. Top edge is box beam construction. Sides and ends are ribbed with 5 and 8-inch channels. Bottom is lined with multiple steel beams. Sturdy ridge bar joins rock guard teeth.



**BOLTED OR FREE-SWINGING PAN**

Heavy steel kick-out pan is ½" thick. Pan can be bolted to body floor for extra protection when loading rock. Remove bolts, and pan has swinging kick-out action... breaks load suction when dumping wet or sticky materials.



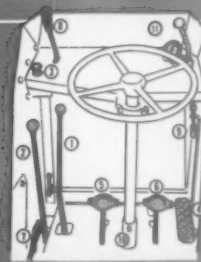
**SIMPLE BODY LATCH**

Body latch for 1-second gravity dump is simple and trouble-free. Latch is engaged by a single hook mounted on the chassis frame. Dump lever is located inside cab in an easy-to-reach position for quick effortless dumping.



**HYDRAULIC POWER-STEER**

Power steering adds to Dumptor maneuverability for fast spotting, lets driver handle off-road travel with ease. Dumptor has a short turning radius of only 19'-3", far less than other haulers of comparable capacity.



**EASY-REACH CONTROLS:**

(1) speed gear shift, (2) directional gear shift, (3) starting aid, (4) foot throttle, (5) clutch pedal, (6) brake pedal, (7) parking brake, (8) body release lever, (9) hand throttle, (10) light control switch, (11) Controller.

**In the ½ to 3-yd ... 8 to 75-ton range, Link-Belt Speeder offers the most complete line of crawler and rubber-tired shovel-cranes ...**

# 31

Here's an opportunity to get exactly the machine you need ... capitalize on scores of advance design features such as—

● **HIGH-SPEED, NON-FATIGUING CONTROLS:** Productivity can go up as much as 25% due to the control system alone. And only Link-Belt Speeder offers Speed-o-Matic power hydraulic controls for fast, safe, precision ... easy, fingertip operation that actually encourages the operator to push the machine

to its high limit *throughout the shift!*

● **BONUS USABLE HORSEPOWER:** Similarly rated shovel-cranes, using the same make and model engine, deliver widely varying amounts of power at the drums. The strength of structural and power train components plus anti-friction bearings, machine cut gears, and splined shafting mean a Link-Belt Speeder can take full advantage of available engine power ... bull through toughest cuts.



# PROFIT MAKERS

● **MORE STANDARD FEATURES, MORE OPTIONS:** With a Link-Belt Speeder you get many profit-making standard features that may not even be furnished as optional features on other machines. And, in addition to these standard features, you can choose from an exceptionally wide range of optional features which tailor the machine for extra profits.

For detailed information on Link-Belt Speeder's 31 profit making shovel-cranes, see your distributor or write: Link-Belt Speeder Corp., Cedar Rapids, Iowa.

14,022-A



**21 FAST AND RUGGED  
CRAWLER MODELS**



**6 BIG-CAPACITY TRUCK-CRANES**  
—all with optional remote control



**4 SELF-PROPELLED MODELS**

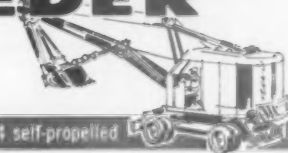
## LINK-BELT SPEEDER



21 crawlers



6 truck-crane



4 self-propelled

**It's time to compare . . . with a Link-Belt Speeder**

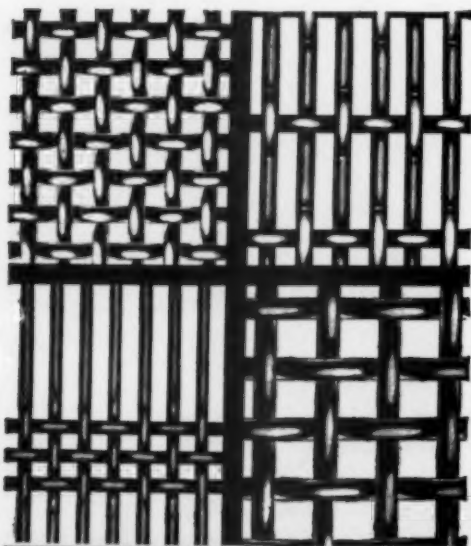
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ROCK PRODUCTS, July, 1958

*Another* reason why L-S Screens are better . . . .



## Precision-applied hook strips on LUDLOW-SAYLOR SCREENS insure better fit, uniform tension, longer screen life



Ludlow-Saylor Screens and Wire Cloth can be furnished of stainless, oil-tempered, high-carbon, monel, bronze, copper, brass, or any other wire.

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Before hook strips are applied, Ludlow-Saylor Screens are trued up on leveling machines and shears to make sure they are perfectly flat and square. Then, bending the hook strips over screen edges is done with special dies made by Ludlow-Saylor to insure absolute accuracy.

The result of this extra care are screens that will fit better and install easier—that can be pulled tighter and will retain a more uniform tension over the entire surface—that won't distort or break—that will last far longer than ordinary screens. Always order L-S Screens . . . you pay no more for the best!

Immediate Shipment of most weaves and sizes

Write for Condensed Screen Reference Catalog

# Ludlow-Saylor

**WIRE CLOTH COMPANY**

602 S. Newstead Ave.

St. Louis 10, Mo.



SALES OFFICES: Birmingham, 1727-6th Ave. N.; Chicago, 5708 W. Diversey; Pittsburgh, Union Trust Bldg.; Houston, 5836 Harvey Wilson Drive; Denver, 1530 Carr St. WEST COAST SUBSIDIARY: Los Angeles, Star Wire Screen & Iron Works, Inc., 2515 San Fernando Road.



## Labor Relations

*continued from page 26*

\$150. When Thompson reported for work after the trial, he was fired. He protested, claiming he had already been disciplined with a five-day lay-off, and that his trial could not be used against him to deprive him of his job.

Was Thompson:  
Right? ☐ Wrong? ☐

*What Arbitrator Livengood, Jr., ruled:*

"Deeply rooted in the American tradition of justice is the principle that a man shall not be twice punished, or even exposed more than once to the risk of punishment, for the same offense." The employee was reinstated.

### Is spending too much time on personal telephone calls just cause for discharge?

*What Happened:*

THE COMPANY POLICY permitted receipt of incoming personal telephone calls, and generally the employees did not abuse the privilege by spending too much time on the 'phone. One employee, Tom Findlay, was in the practice of having long telephone conversations. No supervisor spoke to



him about it, hoping that he would stop the abuse, or that other employees would tell him he might endanger their privilege. As a matter of fact, his group leader had been told by the foreman to "Try and straighten Findlay out about the time he spends on the 'phone."

However, the group leader felt that his job was to lay out work assignments, and not to discipline employees, so he never mentioned the conversation to Findlay. One afternoon the

works manager passed Findlay talking on the 'phone. Some time later, passing again, he found Findlay still at it. He waited until the conversation was over, and then told Findlay that he spent too much time on personal calls. Findlay said he had only been talking 5 min. The manager asked the switchboard operator to check on the extension that Findlay had been using and found out that the call had been for 37 min. He called Findlay into his office and produced this evidence. When Findlay insisted he only spoke for a short time, the manager told him he was discharged for abuse of the personal call privilege which interfered with work assignments.

Was the Manager:  
Right? ☐ Wrong? ☐

### Must all strikers receive same penalty?



*What Happened:*

UNSETTLED GRIEVANCES were piling up and tempers were getting short. The climax came about noon on Wednesday when a group of employees walked off their jobs. By four o'clock, some 300 workers had abandoned their work. Few, if any, of the second shift workers even bothered to report. By the following afternoon, tempers had cooled and the men all came back to work at their regular time. In deciding upon disciplinary action, the company recognized that it couldn't discharge or suspend all 800 workers who had participated. Instead, it decided to give two-week disciplinary layoffs to the first 48 workers who had walked out. The others were merely warned that similar action in the future would be cause for immediate discharge. The men who were punished claimed that they were being discriminated against. The company replied that it had to take some dis-

*What Arbitrator Handsaker ruled:*

"If Mr. Findlay had been warned previously, after one of his long personal telephone conversations, that any repetition of this offense would be the basis for disciplinary action, then such action would have been in order on this occasion. Telling a non-supervisory employee to warn the grievant about his conduct, or calling this abuse of privilege to his attention without warning that disciplinary action would be taken if the offense was repeated, is not sufficient notice. It should be recognized by Mr. Findlay that he has now been put on notice concerning this matter. Grievance upheld. The employee should be reinstated but without back pay."

ciplinary measure in order to avoid a recurrence. Although it could have discharged all of them, it decided to apply the layoff penalty to the first major group that walked off the job.

Was the company:  
Right? ☐ Wrong? ☐

*What Arbitrator P. N. Lehoczky ruled:*

"The company's action in selecting the 48 for discipline is not discriminatory. By examining the time clocks, the company determined that this group was the first to walk out. Although these employees may have been under the impression that others were walking out at the same time, they bear a heavier burden of responsibility for what happened than those who followed them.

Considering the seriousness of the possible consequences of the wild-cat strike, the penalty imposed was more than justified."

END

# PEOPLE

## IN THE NEWS

### New Alpha vice presidents elected



Wagner



Brownstead



Rhodes



Bell

**NORMAN O. WAGNER** has been elected senior vice president of Alpha Portland Cement Co., Easton, Pa. **Ernest F. Brownstead**, general manager of operations; **Richard L. Rhodes**, general sales manager; and **Joseph D. Bell**, New York district sales manager, were named vice presidents.

Mr. Wagner, a civil engineering graduate of the University of Missouri, Columbia, Mo., was formerly vice president of sales. He joined Alpha in 1953 as assistant vice president and became vice president of sales in 1955. In 1956 he was named to the board of directors. Before his association with Alpha, Mr. Wagner was with the Portland Cement Association as district engineer in the Columbus office.

Mr. Brownstead became associated with Alpha in 1934 as power house engineer at the Ironton, Ohio, plant. An industrial engineering graduate of Ohio State University, Columbus, Ohio, he had served part time for the company since 1921. In 1939 he became Ironton plant engineer, superintendent in 1942 and general superintendent of the western division in 1948. In 1955 he was appointed general plant manager and placed in charge of all plants.

Mr. Rhodes studied mining engineering at Lafayette College, Easton, Pa., and joined Alpha in 1928 as a sales representative in western Maryland and West Virginia. He was made service engineer two years later and in 1938 became assistant district manager of the combined Easton and Philadelphia sales districts. In 1940 he was promoted to manager of that district. He has been general sales manager since 1956.

Mr. Bell was a salesman for Phoenix Portland Cement Co. at the time Alpha purchased it in 1928. A student at Alabama Polytechnic Institute, Auburn, and a graduate of Birmingham Southern College, his first assignment with Alpha was as salesman for the southern and south Atlantic states. Later he was made assistant sales manager of the Chicago district and manager of the contract division in New York. In 1952 he was appointed district sales manager in New York.

### Frank Thacher resigns

**FRANK B. THACHER** has resigned as chairman of the board and chief executive officer of The Carbon Limestone Co., Lowellville, Ohio, and its subsidiaries, Carbon Concrete Brick Co., Lay-Rite Concrete Products Co., and Carbon Structural Concrete Co. He will be succeeded by **George H. Donaldson**, president. Mr. Thacher was named honorary chairman of the board of Carbon Limestone Co. and its affiliates.

Mr. Thacher, a native of Missouri, joined the company in 1948 as president and was named chairman of the board in 1955.

Mr. Donaldson is a native of Alliance, Ohio. He joined the company in 1950, was named president in 1955 when Mr. Thacher became chairman of the board.

### U. S. Gypsum sales officials

**ROBERT D. STEPHAN** has been appointed vice president of sales for United States Gypsum Co., Chicago, Ill. He was formerly vice president of dealer sales. **Howard W. Jarvis**,

formerly commodity advertising manager, has been named general advertising manager. **Robert B. Fisher**, formerly assistant to the vice president of dealer sales, has been appointed central division sales manager. **Edward R. Stainback** has been made general dealer sales manager. He was formerly dealer sales manager of the Canadian Mid-East region and will be succeeded by **Wallace R. Weidman**, central division manager. **John D. Sheldon**, formerly sales personnel manager, has been appointed manager of the central industrial division; and **V. R. Beldon**, formerly merchandising manager of dealer sales, has been named to the post of general merchandising manager.

### PCA regional manager



**EDWARD W. THORSON** has been appointed regional manager-district engineer of the new Rocky Mountain regional office of the Portland Cement Association in Denver, Colo. Mr. Thorson, who has been in charge of the Denver district office since 1946, joined the PCA in 1934 and served as field engineer in Iowa and Minnesota before becoming district engineer at Denver. A member of the American Concrete Institute, American Society of Civil Engineers, Colorado Society of Engineers, and National Society of Professional Engineers, Mr. Thorson holds an A.B. degree from Augustana College, a B.S. degree in civil engineering and a civil engineering degree from Iowa State College, Ames, Iowa.

(Continued on page 38)

P&H Diesel Model 687C-18 with Cotta 1.46 to 1 transmission and dual air cleaners at the rear.  
50 KW generator, 240 volt—1800 rpm with dust-tight package controls, driven from front end.



## **P&H DIESEL-ELECTRIC POWER PACKAGE**

*a compact unit... only 4850 lbs. complete!*

With many portable crusher operators switching to electric motors for powering conveyors and auxiliary equipment, P&H has designed the ultimate in a compact, lightweight "power package".

It's the 205 H.P., 6 cylinder P&H Diesel and 50 KW generator. Engine, Cotta Gear, generator and base weigh just 4850 lbs. complete—up to one half ton lighter than comparable equipment. The generator, driven directly off the engine crankshaft through a flexible coupling, is a feature of P&H modern design that eliminates belt wear, slippage and maintenance. The P&H Diesel itself has these added advantages:

- More power
- Higher torque
- Faster starts
- Better idling
- Big weight savings
- Greater fuel economy
- 25% fewer parts
- All wearing parts interchangeable

P&H Diesel units are also available as direct power and for diesel-electric generators. It will pay you to specify P&H Diesel for your new crusher or your next repowering job. Contact your P&H dealer. Or write, Dept. 420A.



P&H combination power unit and generator set powering a Baldwin-Lima-Hamilton 201E Crusher through a Cotta Reduction Gear and driving a 50 KW generator. Owned by Yoder Asphalt, Inc., Elkhart, Ind. Sold by Korte Bros., Ft. Wayne, Ind.

## **HARNISCHFEGER**

**P&H Diesel Engine Division**  
Crystal Lake, Illinois

Enter 1527 on Reader Card

# FACES AND PLACES

... Candid shots of people in the



## Actions do speak louder

Realizing the need to do more than pay lip service to the cause of safety, Consolidated Rock Products Co., Los Angeles, Calif., encourages vigilance among its drivers through an active safety program. Robert Mitchell, center, president, congratulates U. S. Davis, left, and Harry McDonald for driving 21 and 22 years, respectively, without accidents. Both received awards of \$300 at the annual "Drivers' Breakfast."



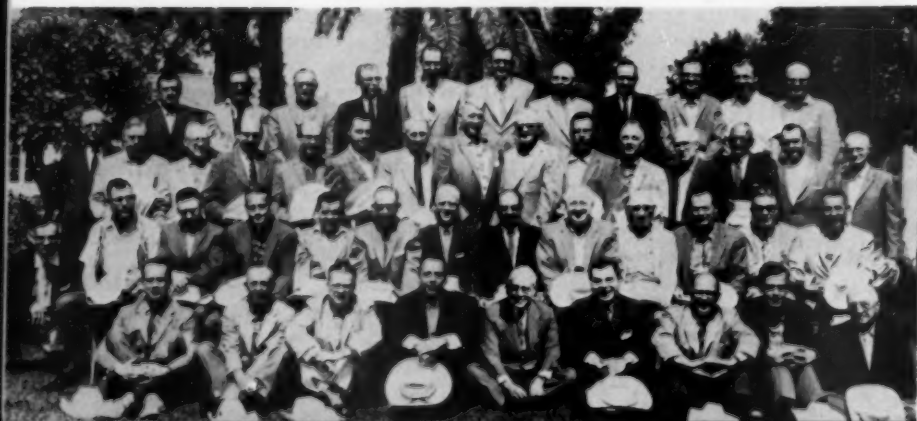
## Builds plant, then runs it

Serving a dual purpose at the new Livermore Valley plant at Pleasanton, Calif., of Rhodes & Jamieson, Ltd., is Frank R. Piper. He is superintendent of the 350-tph. sand and gravel operation, and also supervises construction done at the plant by the company crew.



## Oldtimer with new ideas

Credited with a great many innovations for efficient sand and gravel processing is C. G. Cooley, president of Cooley Gravel Co. He has ample opportunity to put his profit-making ideas to work in several plants, including his recently opened "Gravel Gertie III" dredging setup near Denver.



## Getting acclimated

Apparently the ten-gallon hats enabled delegates to the 17th annual meeting of Vermiculite Institute of Chicago to feel in the swing of things at Chandler, Ariz. The sun-drenched oasis was their choice for convention headquarters during the latter part of March.



## rock products industry



### Says it with flowers

*Welcoming A. W. Heitman to the crushed stone show in Chicago by providing a flower for his lapel is Miss June Pickney. Mr. Heitman is vice president of operations of Inland Lime & Stone Co., Manistique, Mich.*



### Charting their course

*W. D. Jeffrey, right, veteran Arkansas contractor and aggregates producer, gives special instructions to a driller at his new Jeffrey Stone Co. plant near North Little Rock.*



### Talk about limestone

*Minnesotans seen together between sessions at the annual meeting of National Crushed Limestone Institute were John F. Patterson, Patterson Quarries, St. Charles, Einar Nielsen, Hector Construction Co., Inc., Caledonia, Donald Stussy, Stussy Construction Co., Mantorville.*



### At NCLI meeting\*

*Attending one of the social functions during the 1958 annual meeting of National Crushed Limestone Institute were, from left, L. R. Falk of L. R. Falk Construction Co., St. Ansgar, Iowa, Mrs. Falk, Mrs. Powell G. Potts and Mr. Potts, of Southern Stone Co., Inc., Franklin, Kentucky.*

# Another Continental first



## Belt-Powered Hydraulically Operated Tripper

Developed entirely by Continental, this patented hydraulic tripper was specifically designed for handling explosive, corrosive or similar materials where electric trolley wires and cable reels would present a hazard. Elimination of electrical equipment and mechanical reversing mechanisms, together with their required maintenance, make it an attractive installation for handling all bulk materials.

The unit, fully equipped with hydraulic controls, receives power from the conveyor belt and transmits this power through a hydraulic system to the tripper wheels. There are no clutches or friction drives to corrode during down time. The hydraulically operated spring-set brakes provide tripper positioning without creep, crawl, or accidental release.

Consult your nearest Continental office for complete information.

- On any conveying or materials handling problem, consult your nearest Continental office.



INDUSTRIAL DIVISION

**Continental Gin Company**

BIRMINGHAM, ALABAMA

ATLANTA • DALLAS • KNOXVILLE • MEMPHIS • MOBILE • NEW YORK 17

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## PEOPLE IN THE NEWS

(Continued from page 34)

### Material Service officials



Courtney



Douglass

FRANCIS X. COURTNEY and Allan M. Douglass have been appointed vice presidents of Material Service Corp., Chicago, Ill., and Lester Crown, vice president, has been elected to the board of directors. Mr. Courtney joined the company in 1934, became building sales manager in 1949, assistant to the sales vice president in 1955, and assistant secretary in 1956. He is a native of Chicago and attended DePaul University. Mr. Douglass, general sales manager of the specialty products division since 1955 and assistant secretary since 1956, previously served as merchandise manager of the insulation division of National Gypsum Co.

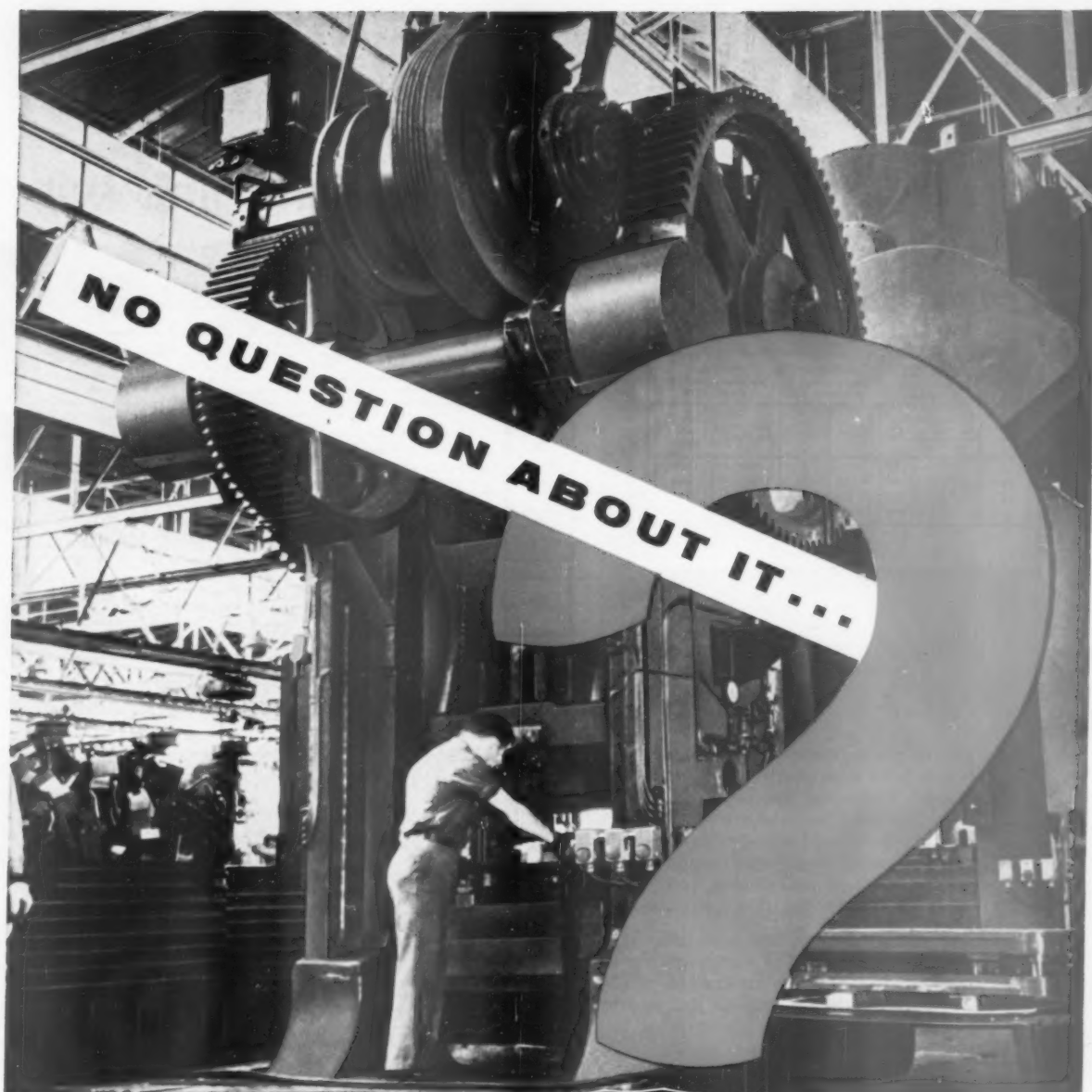
### MLPA president

E. K. HALL, Hall & Riley Quarries, Boonville, Mo., was elected president of the Missouri Limestone Producers Association at its recent annual meeting. R. W. Holub, Concrete Materials & Construction Co., Cedar Rapids, Iowa, was elected vice president, and B. V. Everett, Everett Quarries, Inc., Plattsburg, was named secretary-treasurer. New directors elected to three-year terms are Adolph Adrian, Adrian Materials Co., Jefferson City; Elmer Aussieker, Auxvasse Stone & Gravel Co., Mexico, and Charles Krause, Jr., Columbia Quarry Co., St. Louis.

### Medusa promotions

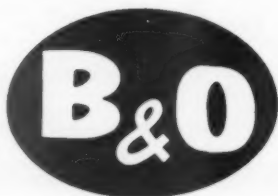
W. N. LAWSON has been named treasurer and assistant secretary of Medusa Portland Cement Co., Cleveland Heights, Ohio. He has been associated with the company for 35 years. Worth Loomis has been named to succeed the late Fredric Pickford as secretary, and P. G. Dawson, a veteran of 45 years in the cement industry, has been elected vice president of finance. He had been vice president and treasurer for 22 years.

(Continued on page 42)



Bituminous is the dependable fuel for  plant power

- Is it readily available?—Yes, it's yours on order!
- Is there enough for any future need?—Sure thing, the supply is practically limitless!
- How about present and future cost?—Price is stabilized by expanding mine mechanization and increasing efficiency of modern burning equipment.



#### **BITUMINOUS COALS FOR EVERY PURPOSE**

Ask our man! BALTIMORE & OHIO RAILROAD, BALTIMORE 1, MD., Phone: LExington 9-0400

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# STURDY CONSTRUCTION,

## mean savings down the line with

TABLE 1.

Belt width, inches	Capacity in tons per hour at belt speed of 100 FPM			Maximum lump size, inches		Maximum recommended belt speed, FPM	
	Wt. of material, lbs. per cu. ft.			Sized	Unsize	Half max. size lumps	Max. size lumps
	50	75	100				
18	27	40.5	54	3	5	400	300
24	50	75.0	100	6-1/2	8	500	400
30	81	121.5	162	7	10	600	450
36	117	175.5	235	8	12	650	500

TABLE 2.

Weight of material, lbs. per cu. ft.	Belt width, inches	Capacity, tons per hour											
		Belt speed, feet per minute											
		100	150	200	250	300	350	400	450	500	550	600	650
50	18	27	40	54	67	81	94	108					
	24	50	75	100	125	150	175	200	225	250			
	30	81	121	162	202	243	283	324	364	405	445	486	
	36	117	176	235	293	352	411	470	528	587	645	704	763
75	18	40	60	80	100	121	141	162					
	24	75	112	150	187	225	262	300	337	375			
	30	121	181	242	302	363	424	486	545	605	665	726	
	36	176	264	352	440	528	616	705	792	880	968	1056	1144
100	18	54	81	108	135	162	189	216					
	24	100	150	200	250	300	350	400	450	500			
	30	162	243	324	405	486	567	648	729	810	891	972	
	36	235	352	470	587	705	822	940	1057	1175	1292	1410	1527

For applications handling materials weighing more than 100 pounds per cubic foot, or extremely abrasive material, refer problem to plant engineers for proper recommendations, belt and idler selection, etc.

THESE pre-engineered selection tables are your head start to savings with Link-Belt PRE-BILT sectional belt conveyors. In ordering, in estimating, in purchasing and other steps as well—comparable cost shortcuts add up to substantial savings. And rugged design throughout keeps maintenance costs down even under severe operating conditions.

For complete facts and application data on Link-Belt PRE-BILT conveyors up to 36-in. wide—with drives up to 40 hp and 24 or 42-in. truss depths, contact your nearby Link-Belt office.

This installation is typical of the exceptionally rugged construction and versatile application of Link-Belt PRE-BILT belt conveyors.







**NO DETAILED DRAWINGS** — From standardized data, a Link-Belt engineer will prepare an "on-the-site" quotation covering the components for your needs.



**LOWER PURCHASING COSTS** — Interchangeability and standardization lower costs and speed selection of parts . . . all available from Link-Belt.



# STANDARDIZED SELECTION...

## Link-Belt PRE-BILT sectional belt conveyors

TABLE 3. Horsepower to drive empty conveyor.

Belt Width Inches	Horsepower to drive empty conveyor for each 100 FPM belt speed											
	Conveyor centers, feet											
	50	100	150	200	300	400	500	600	700	800	900	1000
18	.20	.30	.35	.40	.50	.60	.70	.80	.90	.95	1.00	1.20
24	.30	.40	.50	.60	.70	.85	1.00	1.20	1.40	1.50	1.60	1.70
30	.40	.50	.70	.85	.95	1.10	1.30	1.50	1.70	1.90	2.10	2.30
36	.50	.60	.80	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	3.00

TABLE 4. Horsepower to convey material horizontally.

Tons per hour	Horsepower to convey material horizontally*											
	Conveyor centers, feet											
	50	100	130	200	300	400	500	600	700	800	900	1000
50	.3	.4	.5	.6	.7	.8	.9	1.0	1.1	1.2	1.4	1.6
100	.6	.7	.8	.9	1.2	1.4	1.7	1.9	2.2	2.5	2.7	3.0
150	9	1.0	1.2	1.4	1.8	2.1	2.6	2.9	3.3	3.8	4.1	4.5
200	1.2	1.4	1.6	1.8	2.4	2.8	3.4	3.9	4.4	5.0	5.4	6.0
300	1.8	2.1	2.4	2.7	3.6	4.2	5.1	5.7	6.6	7.4	8.2	9.0
400	2.4	2.8	3.2	3.6	4.8	5.6	6.8	7.7	8.8	9.6	10.8	12.0
500	3.0	3.4	4.0	4.5	6.0	7.0	8.5	9.5	11.0	12.0	13.4	15.0
600	3.6	4.1	4.8	5.4	7.2	8.4	10.2	11.4	13.2	14.4	16.1	18.0
700	4.2	4.8	5.6	6.3	8.4	9.8	11.9	13.3	15.4	16.8	18.8	21.0
800	4.8	5.5	6.4	7.2	9.6	11.2	13.6	15.2	17.6	19.2	21.5	24.0
900	5.4	6.2	7.2	8.1	10.8	12.6	15.8	17.1	19.8	21.2	24.2	27.0
1000	6.0	7.0	8.0	9.0	12.0	14.0	17.0	19.0	22.0	24.0	27.0	30.0
1100	6.6	7.7	8.8	10.0	13.2	15.4	18.7	21.0	24.2	26.5	29.6	33.0
1200	7.2	8.4	9.6	11.0	14.4	16.8	20.5	23.0	26.5	29.0	32.5	36.0

\* Any speed, any material.

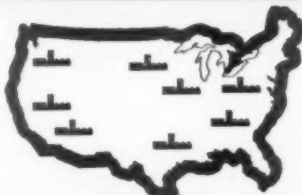
TABLE 5. Horsepower to elevate material

Tons per hour	Horsepower to elevate material											
	Lift, in feet											
	10	20	30	40	50	60	70	80	90	100		
50	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.6	5.1		
100	1.0	2.0	3.0	4.0	5.1	6.1	7.1	8.1	9.1	10.1		
150	1.5	3.0	4.5	6.1	7.6	9.1	10.6	12.1	13.7	15.2		
200	2.0	4.0	6.1	8.1	10.1	12.1	14.2	16.2	18.1	20.6		
300	3.0	6.1	9.1	12.1	15.2	18.2	21.1	24.0	27.0	30.0		
400	4.0	8.1	12.1	16.2	20.0	24.0	28.0	32.0	36.0	40.0		
500	5.1	10.1	15.2	20.0	25.0	30.0	35.0	40.0				
600	6.1	12.1	18.2	24.0	30.0	36.0						
700	7.1	14.1	21.0	28.0	35.0							
800	8.1	16.2	24.0	32.0	40.0							
900	9.1	18.2	27.0	36.0								
1000	10.1	20.0	30.0	40.0								
1100	11.1	22.0	33.0									
1200	12.1	24.0	36.0									

# LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Executive Office, Professional Plant, Chicago 1, To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 20, Canada, Montreal (Tolson 141), Australia, Melbourne (Lindsay), M.B.W. 2, South Africa, London, Johannesburg, Durban, Cape Town, Port Elizabeth.



**NO COSTLY DELIVERY DELAYS**—PRE-BILT conveyors are built at eight strategic locations and are shipped from the plant nearest you to assure prompt delivery.



**QUICK-LOW COST INSTALLATION**—Simple construction and shop-assembled components facilitate field assembly and installation by your own or Link-Belt erectors.



**MINIMUM OPERATING COST**—These conveyors require a minimum of power for the tonnages of materials handled. Maintenance normally consists only of lubrication.

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"Our **BANTAM** averages 120 yds. per hr. loading sand and gravel from stockpile"



"Beats a bigger rig we own!"

Here's another case where the low-cost BANTAM outproduces a larger machine. Palmer Sand and Gravel Co. of Jackson, Mich., uses this BANTAM T-35 to load from scattered points around the pit. Equipped with 1/2-yd. rehandling bucket, the BANTAM loads a 5-yd. dump truck in 1 1/2 to 2 minutes. With two 10-yd. trucks it loads out 450-500 yds. in less than 4 hours, averaging 120 yds. per hour! Commenting on performance, owner Ed Palmer says the BANTAM outstrips his bigger rig.

Regarding maintenance on BANTAMS, Ed Palmer says, "It just doesn't cost anything to run 'em." He now owns 3 BANTAMS—has been a user for 9 years. In all that time his only replacement cost has been one set of swing clutches and 3 sets of trunnion rollers. That's for all 3 machines!

If you're looking for big production at lower costs, look into the money-saving facts about BANTAMS right now. Use the handy coupon.

WORLD'S LARGEST PRODUCER OF  
TRUCK CRANES AND EXCAVATORS



**Bantam Co.**

216 Park Street, Waverly, Iowa, U.S.A.

Please send details on BANTAMS for sand and gravel work with type of mounting checked below: RP-116

☐ Carrier ☐ Crawler ☐ Self-Propelled

Name.....

Company.....

Address.....

City..... State.....



## PEOPLE IN THE NEWS

(Continued from page 38)



### Flintkote president

GEORGE J. PECARO has been elected president of The Flintkote Co., East Rutherford, N.J., in addition to his duties as secretary. He succeeds Perce C. Rowe, who has resigned to devote his major time to other interests. George K. McKenzie has been named executive vice president to succeed Mr. Pecaro. William Feick, Jr., treasurer, has also been named vice president, and Wilson Harvey has been elected a director.

Mr. Pecaro, a graduate of Iowa State College, joined Flintkote in 1939, directing construction of and becoming manager of the insulation board plant at Meridian, Miss. He was named general manufacturing manager in 1946 and the following year became general manager of the Pioneer division. He was elected a vice president in 1948, a director in 1952 and general vice president in 1956.

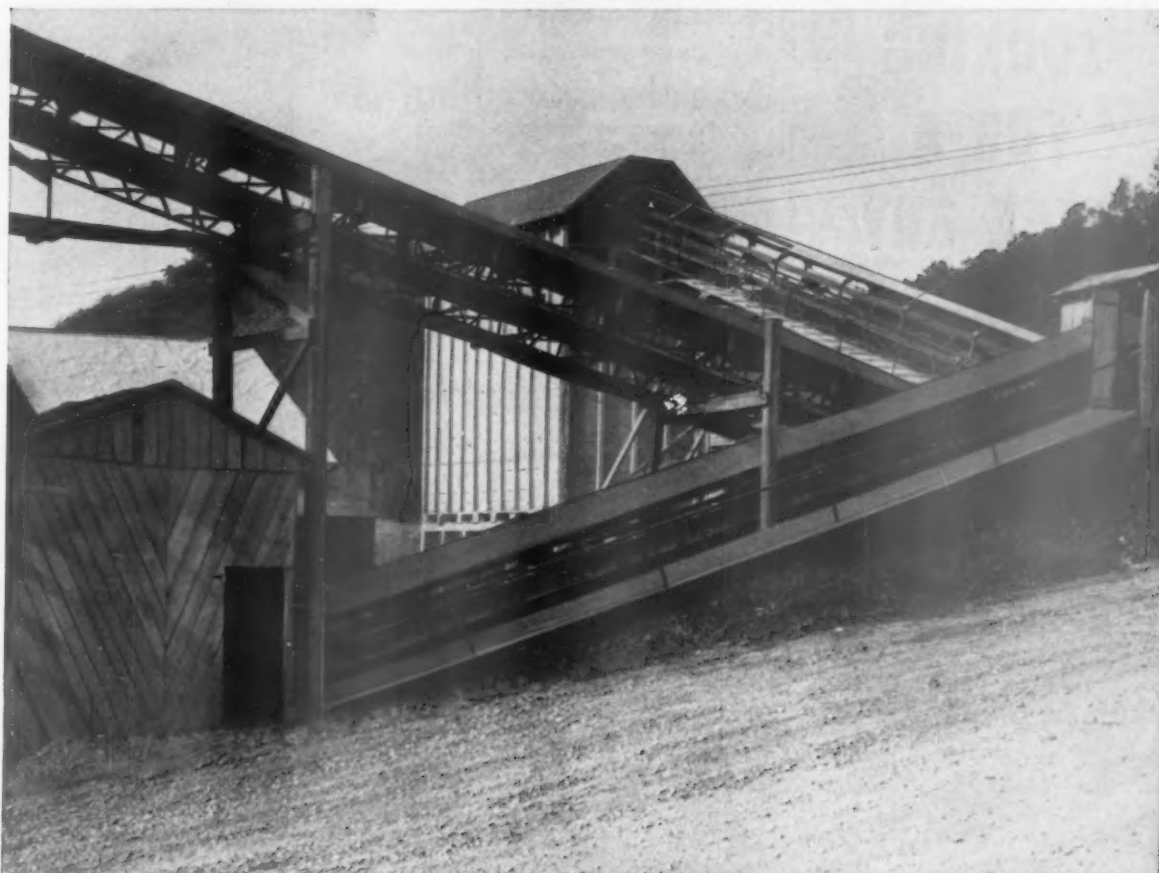
Mr. McKenzie, formerly vice president and secretary, joined Flintkote in 1928. Following a period of training in general office and accounting work, he became insurance manager and served as assistant secretary from 1936 to 1938 when he was named secretary. In 1945 he was elected a vice president and in 1956 a director.

Mr. Feick joined the company in 1956 as treasurer.

Mr. Harvey, who is vice president in charge of the Pioneer division, joined Flintkote in 1941 at East Rutherford, N.J., following graduation from Yale University, New Haven, Conn. In 1956 he was appointed general manager of the Pioneer division and in 1957 became vice president in charge of the division.

(Continued on page 44)

Enter 1401 on Reader Card



Barber-Greene conveyor idlers and return rolls at this plant have required no repairs since they were installed in 1946.

## Original belts and idlers roll on 11 years and ½ million tons later

"Our Barber-Greene conveyors—still equipped with the original belts, idlers and return rolls—have averaged over 50,000 tons of limestone aggregate per year since their purchase in 1946."

That's the report from Landon Vetter, vice president of Vetter Bros., Inc., Oakland, Maryland. He further states: "Our conveyors work an average of 10 hours a day, 5½ days a week, 9 months a year. After their constant service under these conditions, we wouldn't have anything but Barber-Greene conveyors."

Reports like Mr. Vetter's are not unusual because Barber-Greene conveyor idlers offer these distinct advantages: virtually unbreakable, jig-welded base frames . . . self-shedding base angles . . . interchangeable rolls made of heavy steel tubing . . . seamless steel grease reservoirs with Alemite grease fittings . . . 2° tilt to facilitate belt alignment.

Barber-Greene's complete line includes standard troughing idlers and return rolls, flat-belt and picking-table idlers, self-aligning idlers and return rolls, grain idlers, rubber impact idlers and self-cleaning return rolls. Idler widths from 16" to 60" with 4", 5" or 6" rolls.

58-8-PE

Write for complete information.

# Barber-Greene

AURORA, ILLINOIS, U.S.A.



CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

ROCK PRODUCTS, July, 1958

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43

# LOOKING FOR A SAFE BUY IN USED EQUIPMENT?



This sign identifies the *safest buy* in used equipment—a "Bonded Buy" offered by your Caterpillar Dealer. Safest because you get a Guarantee Bond of up to \$10,000, assuring you of satisfactory performance of all parts when you make a "Bonded Buy" on any used Cat-built machine.

Your Caterpillar Dealer also offers a "Certified Buy" with his written guarantee covering units of any make. Or a "Buy and Try" deal, which carries a written money-back agreement.

For the safest buys in today's used equipment market, see your Caterpillar Dealer today.  
Caterpillar Tractor Co., Peoria, Ill., U.S.A.

## CATERPILLAR

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**BEST BUY IN NEW  
AND USED EQUIPMENT**

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## PEOPLE IN THE NEWS

(Continued from page 42)

### Gifford-Hill president

P. W. GIFFORD has been elected president of Gifford-Hill & Co., Inc., Dallas, Texas, and affiliated companies, Southwest Construction Materials Co., Coastal Plains Supply Co., Dallas Concrete Co., Grand Prairie Construction Co., Trux Mix Concrete Co. and Evangeline Railway Co. Formerly executive vice president, Mr. Gifford succeeds J. Rutledge Hill who has been named chairman of the board. John R. Hill, Jr., formerly chief engineer, has been made first vice president. Other vice presidents are D. B. Keller, H. M. Lacy, J. A. Whyte and J. H. Wilson. R. E. Wynne is secretary-treasurer.

### Pretoria chairman

B. G. TWYXCROSS has been appointed chairman of the board and managing director of the Pretoria Portland Cement Co., Johannesburg, South Africa.



### AIME vice president

ROGER V. PIERCE, an international mining consultant of Salt Lake City, Utah, has been elected vice president and director of the American Institute of Mining, Metallurgical and Petroleum Engineers.

(Continued on page 46)

## OBITUARIES



**Miller A. Garrison**, vice president in charge of operations of Monolith Portland Cement Co., Los Angeles, Calif., died April 17. He was 67 years of age and had been associated with the firm for 35 years. A native of Monroeville, N. J., Mr. Garrison received his education in the elementary and high schools in Monroeville, and the Banks Business College, Philadelphia, Pa. He joined Monolith in 1923 as timekeeper, became assistant superintendent in 1928 and superintendent in 1929. He was promoted to superintendent of inventories in 1949 and two years later was named vice president in charge of operations and a member of the board of directors.

**Gabriel Scott Brown**, former president and chairman of the board of the Alpha Portland Cement Co., East-

on, Pa., died April 13 after an illness of two years. He was 87 years of age. A graduate civil engineer, Mr. Brown joined the Alpha, N.J., plant as chief clerk in 1898. He was elected secretary-treasurer the following year and was named to the board of directors in 1906. In 1911, he was elected vice president in charge of operations. Three years later he was named president and served until 1935 when he was made chairman of the board. He became honorary chairman in 1949.

Mr. Brown, a graduate of Hillman Academy, Wilkes Barre, Pa., and Princeton University, Princeton, N. J., served three terms as president of the Portland Cement Association, three terms as chairman of the board of directors, four terms as treasurer, and was a member of the executive committee for nine years.

**Edwin S. Turner**, sales engineer for The Bessemer Limestone & Cement Co., Youngstown, Ohio, for the last eight years, died May 3. He was 50 years of age.

**Clyde C. Beam**, president of the Melvin Stone Co., Melvin, Ohio, died April 19 after a three-year illness. He was 74 years old, and had also served as vice president of the Clinton Construction Co. and the Clinton Asphalt Paving Co.

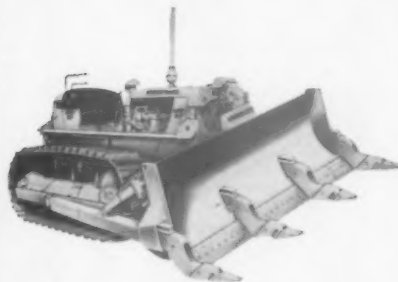


# D7 Stockpiles 2,500 Tons of Gravel a Day

"and you seldom see it in the shop!"



## NEW! CAT No. 7G BULLDOZER!



Blade tilts 3' to either side, tips through 16½° arc, slices through hard materials. Teeth pick up and carry. Call for an eye-opening demonstration right on your job!

Gravel Contractor R. J. Jager of St. Paul Park, Minn., turns this Caterpillar D7 Tractor loose whenever he needs fast production. In the photograph above it's stockpiling sub-base gravel from a crusher conveyor pile. Five trucks haul the gravel to the paving roadway, so the D7 stays busy all day. In 10 hours it 'dozes 2,500 tons, and does it day in and day out.

"You seldom see it in the shop," says Mr. Jager. "It's very dependable. Right on top of the heap. That D7 with a 'dozer is an ideal combination around a crusher operation. Not only does it stockpile our entire output, but it works down in the pit where rubber-tired units bog down. Does a host of other 'dozing jobs, too, that make it a very important machine around here."

Superior construction is the reason you seldom see big yellow Cat track-type Tractors in the shop. Example: the exclusive Caterpillar oil clutch—enclosed

in a dust-proof housing—practically eliminates clutch adjustments and replacement. Example: fuel injection valves are permanently sealed; they're interchangeable, they can be installed individually without adjustment; and their single orifice nozzle resists clogging. Example: tight-fitting seals and gaskets keep dust and abrasives out of lube oil, fuel and coolant.

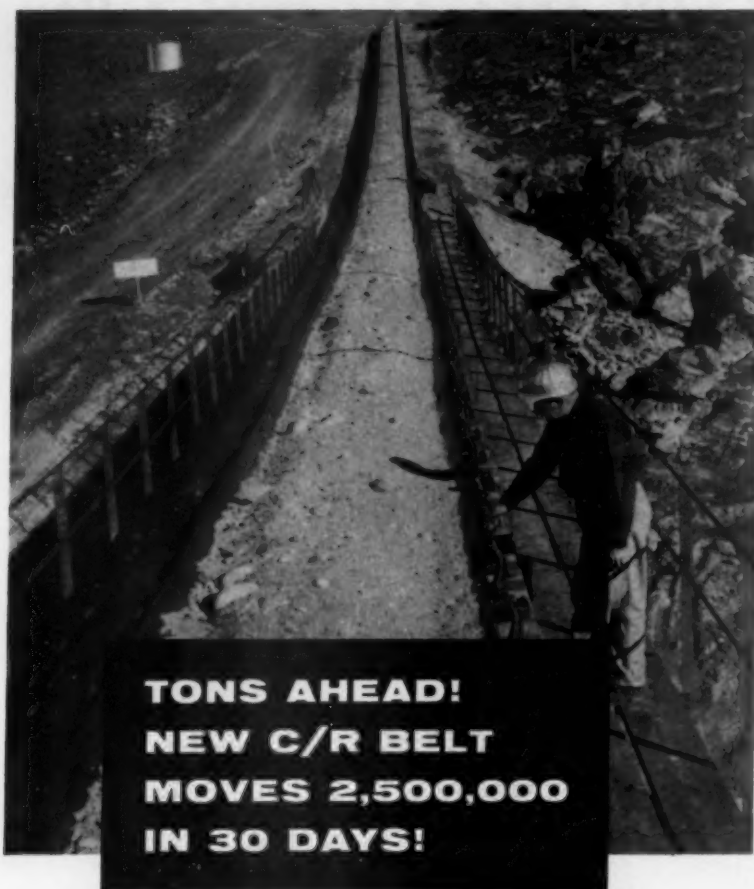
Call your Caterpillar Dealer and let him show you, on the toughest job you can find, why Caterpillar track-type equipment means steady production at low cost.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR

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**FOR MINING'S  
TOUGHEST JOBS**



**TONS AHEAD!  
NEW C/R BELT  
MOVES 2,500,000  
IN 30 DAYS!**

"Miracle fiber muscle" has helped revolutionary C/R conveyor belting set new world records in aggregate handling! At Great Salt Lake, where Hewitt-Robins developed an amazing 2-mile bulk materials handling system, these new C/R belts, **speeding at 850 feet per minute** and sometimes handling over 6,000 tons per hour, have established a new world record of 2,500,000 tons in 30 days!

Hewitt-Robins research, engineering, and field experience have utilized latest advances in "miracle fibers" to produce a new C/R conveyor belt which far surpasses ordinary types of synthetic and natural fiber reinforced belting. Only Hewitt-Robins C/R conveyor belts, with higher tensile strength, lower stretch, increased flexibility, fatigue resistance, and the toughness contributed by these miracle fibers, could establish this record.

Whether your problem is moving mountains, mining ore, transporting coal, or feeding furnaces, specify a modern H-R miracle fiber C/R belt. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Conn.



**HEWITT-ROBINS**

CONVEYOR BELTING AND IDLERS... POWER TRANSMISSION DRIVES  
INDUSTRIAL HOSE... VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

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Amsterdam, Holland • Johannesburg, South Africa • London, England • Montreal, Canada • Paris, France

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## PEOPLE IN THE NEWS

(Continued from page 44)



### New Haven personnel director

RAYMOND H. GREEN has been named director of personnel and public relations of the New Haven Trap Rock Co., New Haven, Conn., according to an announcement by Albert L. Worthen, president. Mr. Green, a native of New Britain, Conn., joined the company in 1951 and served as safety engineer until his present appointment. He is secretary of the executive committee of the Cement, Quarry and Mineral Aggregates section of the National Safety Council, and secretary of the Eastern New York Mineral Aggregates Safety Council. Mr. Green was formerly assistant secretary of the Connecticut Society of Civil Engineers and is a member of the Connecticut Safety Society.

David W. Anderson, who has been associated with New Haven since 1956, succeeds Mr. Green as safety engineer. He is a native of Stratford and attended the University of Bridgeport, Conn.

### Joins Mississippi Lime

JOHN L. HAMMER, JR. joined Mississippi Lime Co., Alton, Ill., June 1 as assistant to the president, Harry B. Mathews. Mr. Hammer formerly was director of marketing for the Organic Chemicals Division, Monsanto Chemical Co., St. Louis, Mo.

Prior to joining Monsanto in 1952, Mr. Hammer was vice president and director of Smith, Kline & French Laboratories, Philadelphia, Pa. A native of Philadelphia, he was educated at the University of North Carolina, and in 1956 he attended the Advanced Management Program at Harvard University Graduate School of Business Administration.

(Continued on page 48)



**Ingersoll-Rand**

<sup>®</sup>  
**QUARRYMASTER**

## **"DOWN THE HOLE DRILL" PERFORMANCE Results in Two Repeat Orders**

An Ingersoll-Rand Quarrymaster in Quebec, Canada, is now at work drilling the extremely hard and abrasive quartzite cap rock formation overlying an extensive magnetite iron ore body. This machine utilizing an I-R DHD-400 "down the hole drill" and 7 inch Carset bits has averaged 15 to 20 feet of hole per hour since the unit went into operation last spring.

Test holes in the Magnetite iron ore indicate

that overall drilling speed in the ore will be twice that in the cap rock. In the ore body the face height will be 25 feet.

Based on the performance of the first unit over the past six months, two additional units are now on order. Phone or write your I-R man today requesting full particulars on the high tonnage performance of this and other Quarrymaster installations.

**Ingersoll-Rand**  
5-747 11 Broadway, New York 4, N. Y.



**DRIFTERS • JACKDRILLS • JACKHAMERS • CRAWL-IR DRILLS • CARSET BITS • AIR TOOLS • COMPRESSORS**

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ROCK PRODUCTS, July, 1958



## 4 BIG REASONS WHY

**Hanco** ELECTRIC SCREEN HEATERS  
serve best in American Industry

- 1 • ELIMINATE BLINDING
- 2 • INCREASE TONNAGE
- 3 • BUILD GREATER PROFITS
- 4 • SPEED PRODUCTION

We welcome your inquiries. Be sure to include materials for screening and equipment in use. Hannon engineers will make recommendations which will increase your production and reduce your screening costs. Data sheets available without obligation.

PIONEERS IN ELECTRIC SCREEN HEATING

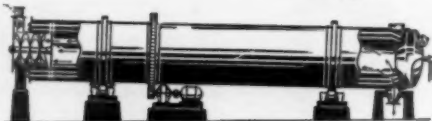
**F. R. HANNON & SONS**

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Above is the interior of a Ruggles-Coles steam-tube dryer for drying materials injured by high temperature or where a standard type dryer creates a hazard. Dryers built to your requirements, of corrosion-resistant metals if desired. Bulletin 16-D-7.



**Ruggles-Coles  
Steam-Tube  
DRYERS**

- Aluminum
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## PEOPLE IN THE NEWS

(Continued from page 46)

### Lehigh plant manager

GEORGE N. WHIPPLE has been appointed manager of the Buffalo, N.Y., plant of Lehigh Portland Cement Co., Allentown, Pa., succeeding Jacob B. Zook, who has retired after 32 years of service.

Mr. Whipple joined Lehigh in 1950 as a junior engineer in the Mason City, Iowa, plant following graduation from Iowa State College, Ames, Iowa. He later served as plant engineer at the Sandt's Eddy, Pa., plant, transferring to the Buffalo plant in 1953. He has been assistant plant manager at Buffalo since last June.

Mr. Zook started his career in the cement industry in 1926 as chief engineer of the Buffalo plant of Great Lakes Portland Cement Co. and continued in that capacity when the company was purchased by Lehigh in 1927. He was appointed plant manager in 1952.

### National Gypsum managers

WILLIAM W. GERBER has been named central sales division manager of the National Gypsum Co., Buffalo, N.Y., for Ohio, Michigan, eastern Kentucky, part of West Virginia, western Pennsylvania and western New York. He was formerly manager of the Buffalo sales district and will be succeeded by John C. Berlin, assistant manager of Buffalo sales. David G. Stenberg, who served as central division sales manager, has been appointed prefabricated sales manager, and H. G. Lord succeeds George W. Handy, who has retired, as technical director of the commercial trade sales division.

### Alpha director of purchases

RAY L. HAMILTON has been appointed director of purchases for Alpha Portland Cement Co., Easton, Pa., and James I. Maguire has been named purchasing agent. The western and eastern purchasing departments have been consolidated and all purchases are handled from the Easton office.

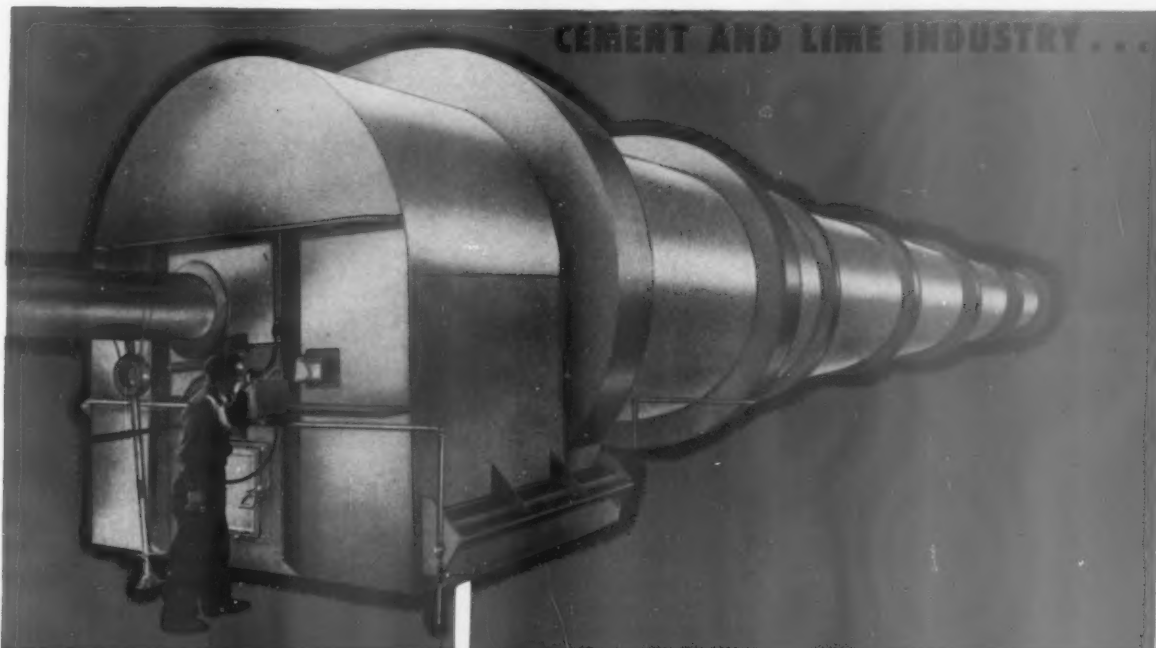
Mr. Hamilton, a graduate of the University of Illinois, Urbana, Ill., has been with Alpha since 1921, when he started as assistant to the western purchasing agent. He was promoted to western purchasing agent in 1939.

Mr. Maguire, who joined the eastern purchasing department in 1949, has headed that department since 1952. He is a graduate of Princeton University, Princeton, N. J.

END



*A. P. Green* **REFRACTORY PRODUCTS A COMPLETE LINE OF  
REFRACTORY PRODUCTS  
FOR THE**



**CEMENT AND LIME INDUSTRY...**

**80% ALUMINA**  
**KRUZITE (70% Alumina)**  
**MIZZOU (60% Alumina)**  
**BIG CHIEF (50% Alumina)**  
**KX-99**  
**CLIPPER**  
**A. P. GREEN HOT ZONE**  
**EMPIRE**

**your assurance of MAXIMUM  
service at LOWEST cost ...  
REGARDLESS of the operating  
conditions in your plant**

*Whatever your refractory problem  
or requirement, for specific  
recommendations without obligation  
to you, contact your local A. P. Green  
representative. You'll find him  
listed in the yellow pages of your  
telephone directory or write:*

In the cement and lime industry, operating conditions vary with each individual plant. Burning temperatures, chemical composition of the charge and many other factors influence the selection of the proper refractory material for a given job.

For half a century, the A. P. Green Fire Brick Company has been a leader in developing refractories to meet the exacting needs of the cement and lime industry. Your A. P. Green representative provides the engineering experience and knowledge, coupled with his complete line of A. P. Green Refractory Products, to give you a lining for maximum service at lowest cost.

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*A. P. Green*  
**REFRACTORY  
PRODUCTS**



**FIRE BRICK COMPANY**

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PLANTS: Mexico, Mo. • Woodbridge, N. J. • Sulphur Springs, Texas • Jackson,  
Oak Hill, South Webster, Ohio • Philadelphia, Pa. • Troy, Idaho  
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ROCK PRODUCTS, July, 1958

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# INDUSTRY

## NEWS

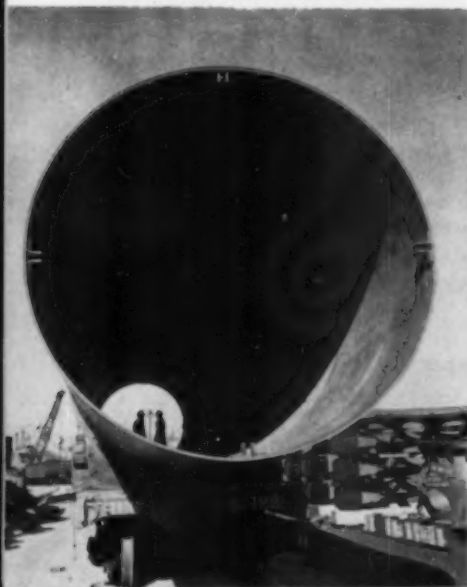
### Process devised for feeding wet slurry to vertical kiln

FEEDING WET SLURRY to a vertical shaft cement kiln has been made possible through a process developed by Dr. Steven Gottlieb, Managing Director, Gippsland Industries, Ltd., Melbourne, Australia. Patent applications have been filed for the process in which the slurry is fed into a rotary dryer and dehydrated by a counter-current flow of gases from a burner or kiln. Nodules having a water content of 15 to 20 percent are formed, which then are fed to the vertical kiln and burnt to clinker in the usual manner.

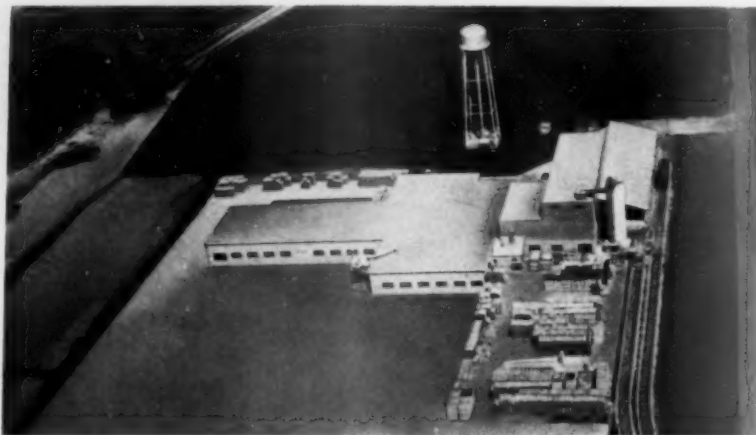
Fuel, such as raw crude coal and/or coke of up to about 1/8-in. particle size is fed into the drum with the slurry and this is incorporated in the nodules. If the nodules are to be fed to a rotary kiln, no fuel is added to the slurry. Prenodulizing of the material enables the kiln length to be reduced with consequent reduction in heat losses and power consumption. Besides nodulizing the slurry, the method provides a dust collector, as all dust from the flue gases of the rotary kiln are caught in the nodules and fed to the vertical kiln.

Information on the new process was supplied by *Chemical Engineering*, through the McGraw-Hill World News office in Melbourne.

### Ship kiln to Mexico in 26 railroad cars



This 70 ft. long kiln shell section was part of a shipment from Allis-Chalmers Manufacturing Co. to Cementos Guadalajara, S.A., Jalisco. Twenty-six railroad cars were used to make the shipment; 15 cars shipped the 12 x 350-ft. kiln itself, which was sent out in five shell sections, three cars needed for a section. Three complete cement - manufacturing plants have been shipped to Mexico by Allis-Chalmers since November of last year.



### Third Insulrock plant goes into production

THE FLINTKOTE Co., East Rutherford, N. J., opened its third Insulrock plant at North Judson, Ind., May 15. The new plant will increase by 50 percent production of the building slab from Flintkote's Linden, N. J., and Richmond, Va., plants. It has a capacity of 60,000 tpy.

The North Judson plant, serving Chicago and midwestern areas, is located on a 30-acre tract. It has 49,000 sq. ft. of interior floor space, with 113,000 sq. ft. of paved yard. Rail facilities include New York Central.

Insulrock is an acoustical, insulating, fireproof building material, used for combination roof decks and ceilings, floor slabs, structural insulation, interior sheathing, stucco base, interior plaster base and as acoustical material. Developed in 1946, the slabs are composed of chemically treated wood fibers that are coated with portland cement and bonded together under pressure.

### Construct Aglite plant in Minneapolis area

SAYRE & FISHER Co., Sayreville, N.J., is constructing a \$1-million plant near Minneapolis, Minn., for North Central Lightweight Aggregate Co., Inc. The contract has been sponsored and arranged by White, Weld & Co., an investment banking firm. The plant is scheduled for opening this summer.

At the present there are five Aglite plants in the United States and one near Derby, England. All have been built under the supervision of Frank Leftwich, developer of the Aglite sintering process. He is vice president of Sayre & Fisher and president of its subsidiary, Aglite Corp. of America. Sayre & Fisher is negotiating with groups throughout the U.S., in Thailand, West Germany, Australia and Canada to build plants under royalty and franchise arrangements similar to that made with North Central.

(Continued on page 55)

Put a **PLUS** on  
your profit side  
**REX® CHABELCO®**  
**STEEL CHAINS**



For your conveying and elevating needs, you'll find the *plus values* in Rex Chabelco Steel Chains an important factor in increasing productive capacity...eliminating the costly down time that cuts into your profit picture. They're precision-made...designed to provide the longest possible service life. Built-in extra working strength enables them to handle heavier loads.

**UNSURPASSED "WEARABILITY"**...Rex Chabelco Chains provide longest wear life. Balanced design of parts eliminates "weak spots"...strengths of side plates, bushing, rollers and pins are balanced with each other to assure lowest unit pressures in the chain joint.

**PERMANENT PRESS-FIT CONSTRUCTION**... these chains never "come apart." Precision-made parts, held to carefully controlled tolerances, are assembled into a permanent unit by heavy press fits... even when field assemblies are required. They're put together to stay.

**EXTRA STRENGTH**...all parts are carefully hardened in the most modern heat-treating equipment to provide maximum resistance to heavy shock loads. Built-in clearances between parts enable these chains to operate effectively in dusty, dirty operating conditions.

**HUSKY ATTACHMENT LINKS**...scientifically designed so that there are no sharp bends to set up life-destroying fatigue stresses. Attachment links are not "weak links" in Chabelco chains; they're as *extra strong* as the plain chain links...handle loaded bucket, flights and other attachments with ease.

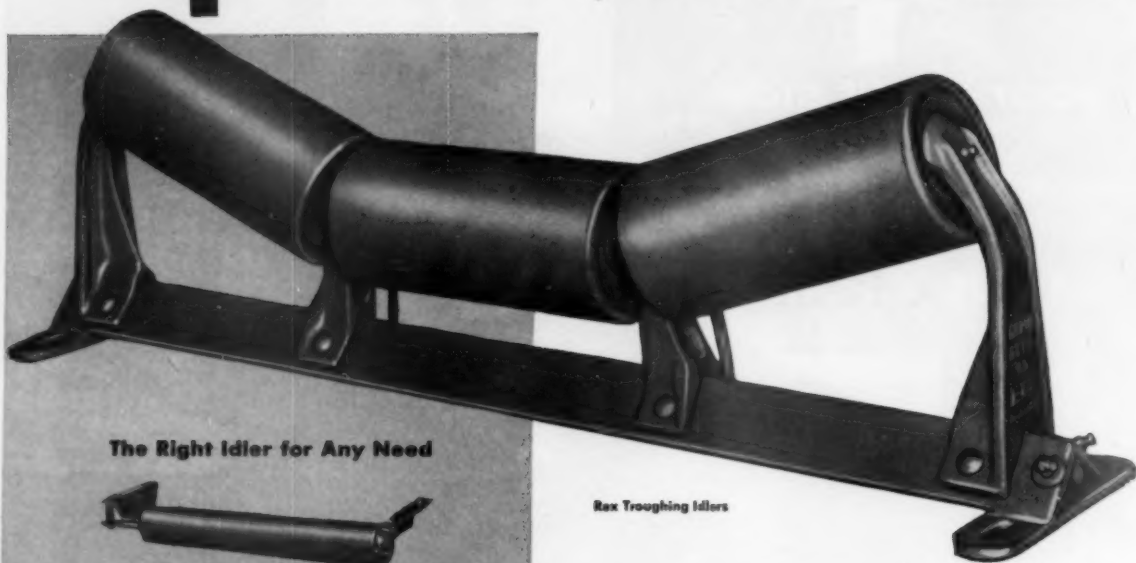
There's a Chabelco steel chain to suit any conveying, elevating or power drive requirement...all with the built-in *plus values* that put a plus on your profit side.

For complete information, write for your copy of Bulletin 5766. CHAIN Belt Company, 4649 W. Greenfield Ave., Milwaukee 1, Wis.

**CHAIN BELT**

TURN  
PAGE

## the **PLUS** values in...REX Belt Conveyor Idlers



Rex Troughing Idlers

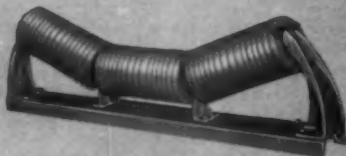
### The Right Idler for Any Need



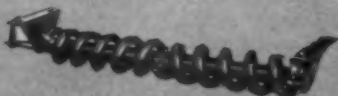
Return idlers matched companion idlers to Rex Troughing idlers...built with the same plus value features and advantages.



Belt Training Troughing idlers assure automatic alignment of conveyor belt.



Impact idlers installed under loading areas, these idlers absorb impact shocks...protect belt against cover lacerations and carcass ruptures.



Spiral Return idlers unique spiral design, with over-shifting support of the belt, allows clinging material to drop through on return run, preventing build-up of materials on return idlers.

**AND MANY OTHER STYLES**

The Rex Rated Idler line...most complete in the industry...has unequalled *plus values* that mean lower unit costs...longest life for both idlers and belt. They're *rated* for performance, guaranteeing you the best idler for your service requirements...simplest, quickest correct selection. You select from easy-to-use tables...and know, in advance, that the idlers you choose are right for you. No need to buy more than you need...no need to take less than you require!

Rex Rated Idlers are classified in four basic service groups: moderate-service line...standard-service line...heavy-service line...super-service line. Each has a broad choice of models to suit any operating requirement...built-in *plus values* that mean so much more for your money.

- High-grade antifriction bearings with ample radial and thrust load capacity.
- Positive and permanent bearing protection against dust and dirt, with minimum service attention.
- Heavy roll shells of unit construction...no joints to loosen or corrode.
- Long-life, sturdy steel frames with rigidly tight, shockproof brackets.
- Minimum servicing and easy maintenance.

For all the facts on Rex Rated Idlers and Selection Tables, write CHAIN Belt Company, 4649 W. Greenfield Ave., Milwaukee 1, Wis.

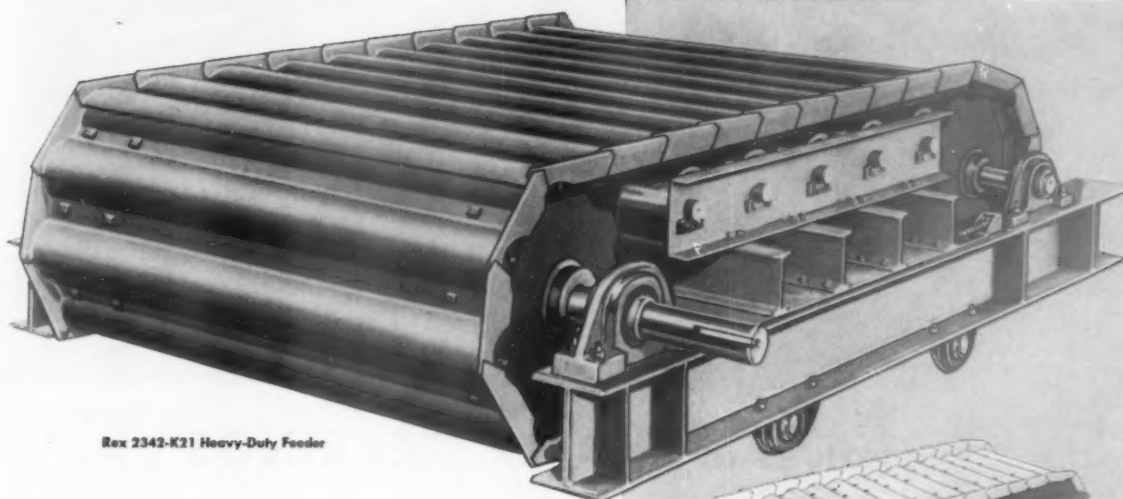
# CHAIN BELT

Engineered Belt Conveyors • Belt Idlers • Pulleys • Terminal Machinery • Bucket Elevators • Feeders • Bulk Handling Conveyors •

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# the **PLUS** values in...REX Apron Feeders



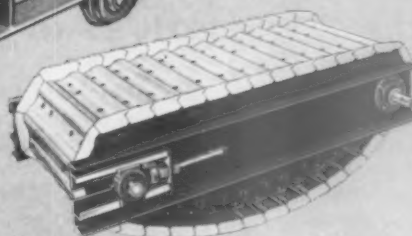
Rex 2342-K21 Heavy-Duty Feeder

To get maximum production at lowest unit cost...to assure steady, uniform material flow...to provide maximum life of equipment, you need the *plus* advantages of Rex Apron Feeders.

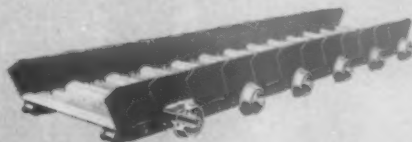
These efficient units accurately control material flow from hoppers and bins to crushers and conveyors. Their ability to provide a "metered" flow regardless of material size eliminates "flooding" or "starving" of subsequent operations. Control of impact or elimination of "scuffing" which occurs on some other types of feeders is an important advantage of Rex Apron Feeders that adds life to "fed" equipment. Conveyor belts are protected against ruptures and lacerations of damaging heavy impacts.

Rex Apron Feeders can be furnished completely self-contained or as "packaged" units...available in several basic styles to suit service requirements. The heavy-duty Rex 2342-K21 Feeder illustrated above is ideal for primary and secondary applications. Ruggedly built with an outstanding record for dependability and minimum maintenance, the Rex 2342-K21 Feeder relies on large-diameter rollers for support of the load, with chain mounted under leakproof aprons.

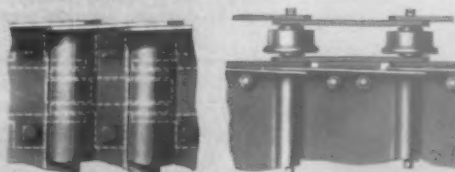
Other styles of Rex Feeders are available for all types of service. For complete information on Rex Apron Feeders, Apron and Pan Conveyors, and how they can help you get maximum production at lowest unit cost, write CHAIN Belt Company, 4649 W. Greenfield Ave., Milwaukee 1, Wis.



Rex 531-K17 Apron Feeder used for installation under hoppers and bins to regulate flow of bulk materials in light-duty service.



Style A leakproof apron with outboard rollers and equalizing saddles combines the advantages of minimum spillage, equal chain load distribution, and accessible working parts. Ideally suited for most low-impact applications.



Style A aprons with Type K or A chain attachments can be furnished as machinery parts for many applications.

## CHAIN BELT

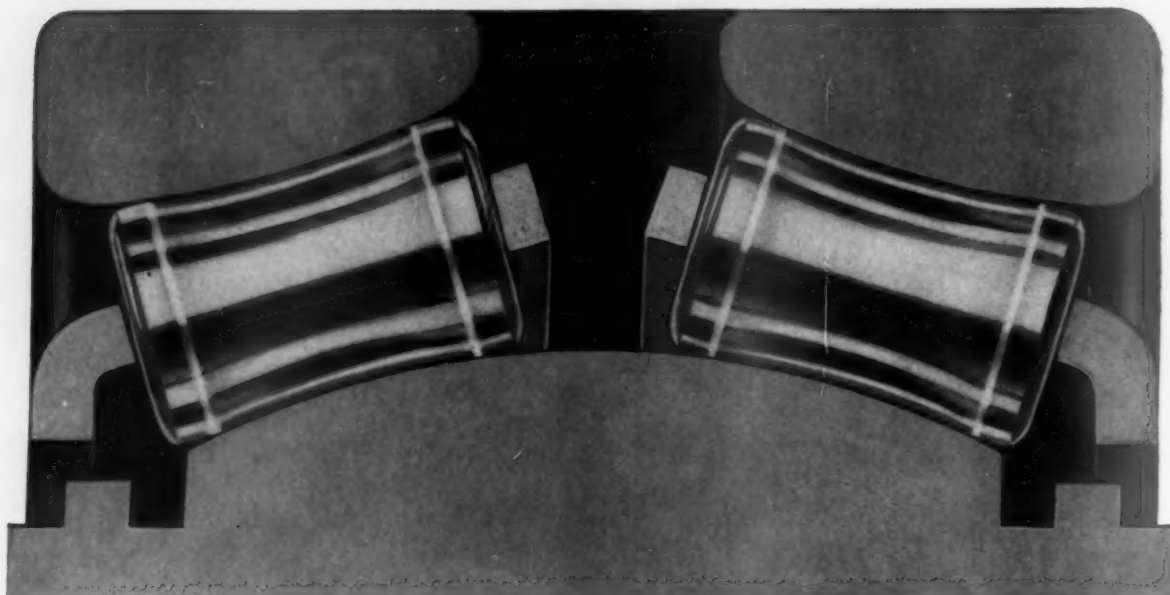
Conveyor and Drive Chains • Sprockets • Traction Wheels • Roller Bearings • Flexible Couplings • Spray Nozzles

TURN  
PAGE

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ROCK PRODUCTS, July, 1958

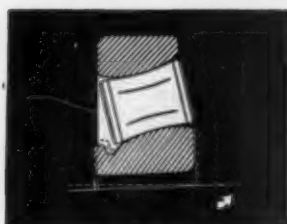
53



## the **PLUS** values in SHAFER® BEARINGS

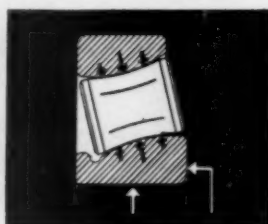
Combine the low-rolling friction of a ball...the high load-carrying capacity of a roller...and you have the *plus* advantages in Shafer Self-Aligning Roller Bearings. These bearings maintain their high load-carrying capacity under shock loads...continuous heavy-duty loads under misalignments.

Specifying Shafer puts an important *plus* in better service...longer life for your equipment. Remember, a Shafer Bearing will deliver its rated load capacity for *five years or more*. Compare this with other bearings with an average life rating of one year or less. Here's why!



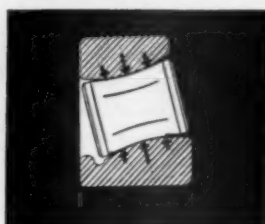
**SHAFT DEFLECTION**

Shafer design permits unrestricted compensation for shaft deflections, misalignment, shock loads...permits a total of 3° of misalignment.

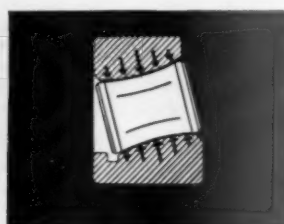


**RADIAL, THRUST OR COMBINED LOADS**

Shafer free-roller design handles radial, thrust or combined loads without loss of bearing capacity. There is no roller end wear...no need for guide flange at roller end.



**Under Normal Load**



**Under Heavy Load**

### SHOCK RESISTANCE

The high inherent elasticity of the bearing-quality alloy steel rollers and raceways provides maximum resistance to shock loads. The elasticity of these rollers and raceways permits compression under load and shocks...the contact area increases to fit the bearing area to the load requirement.



**Pillow Blocks**



**Flange Units**



**Flange Cartridge Units**



**Cartridge Units**



**Duplex Units**



**Take-Up Units**



**Take-Up and Frame Units**



For complete data on the *plus* advantages of Shafer Bearings, write for your copy of Bulletin No. 33. Chain Belt Company, 4649 W. Greenfield Ave., Milwaukee 1, Wis.

**SALES OFFICES:** Appleton, Wis.; Atlanta, Ga.; Baltimore, Md.; Birmingham, Ala.; Boston, Mass.; Buffalo, N.Y.; Charlotte, N.C.; Chicago, Ill.; Cincinnati, Ohio; Cleveland, Ohio; Dallas, Tex.; Denver, Colo.; Detroit, Mich.; East Orange, N.J.; Grand Rapids, Mich.; Houston, Tex.; Jacksonville, Fla.; Kansas City, Mo.; Los Angeles, Cal.; Milwaukee, Wis.; Minneapolis, Minn.; Moline, Ill.; Montreal, Can.; New York, N.Y.; Odessa, Tex.; Oklahoma City, Okla.; Philadelphia, Pa.; Pittsburgh, Pa.; Portland, Ore.; St. Louis, Mo.; Salt Lake City, Utah; San Francisco, Cal.; Seattle, Wash.; Springfield, Mass.; Toronto, Can.

# CHAIN BELT

4649 W. Greenfield Ave., Milwaukee 1, Wis.

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## INDUSTRY NEWS

(Continued from page 50)

### Colonial predicts earnings; enters cement industry

COLONIAL SAND & STONE CO., INC., New York, N.Y., says there is a reasonable chance earnings in 1958 will equal 1957's. According to Anthony Pope, president, the outcome rests upon a good second half. The company's earnings in 1957 were \$1,337,404, or \$1.49 a share, based on sales of \$42,447,797.

The new cement plant at Kingston, N.Y., which the company's subsidiary, Hudson Cement Co., will operate, will go into production late this year. Initial capacity of the \$3.5-million plant is about 825,000 bbl. per year.

### Lime film wins festival award

OHIO LIME CO., Woodville, Ohio, sponsor, and Austin Productions, Inc., producer, were awarded the Chris award by the Greater Columbus Film Council for their motion picture, "Gift of the Ages."

The 15-min. color-sound picture was made in cooperation with Carnegie Museum, Pittsburgh, Pa. It traces the history of limestone, showing how it was formed more than 350 million years ago and how limestone products are basic to everyday living. The film is available on free loan upon request.

### Pavement yardage

AWARDS OF CONCRETE PAVEMENT for the month of April and the first four months of 1958 have been classified by Portland Cement Association as follows:

Sq. yd. awarded during:			
	April	1st 4 mos.	
Roads .....	7,438,762	19,550,394	
Streets and alleys ...	3,650,702	8,259,601	
Airports .....	2,238,549	3,113,042	
Totals .....	13,328,013	30,923,037	

### Improvement in earnings over last year noted

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., reported a 7½-percent improvement in its net income for the first quarter of 1958, compared with the like period of 1957. According to W. A. Wecker, president, more efficient plant operations contributed about 3½ percent of the increase. Receipts for the quarter totaled \$6,219,442. Net income was \$515,746, or 18 cents per share.

(Continued on following page)

*high*  
**screening efficiency**

here's another of several good reasons

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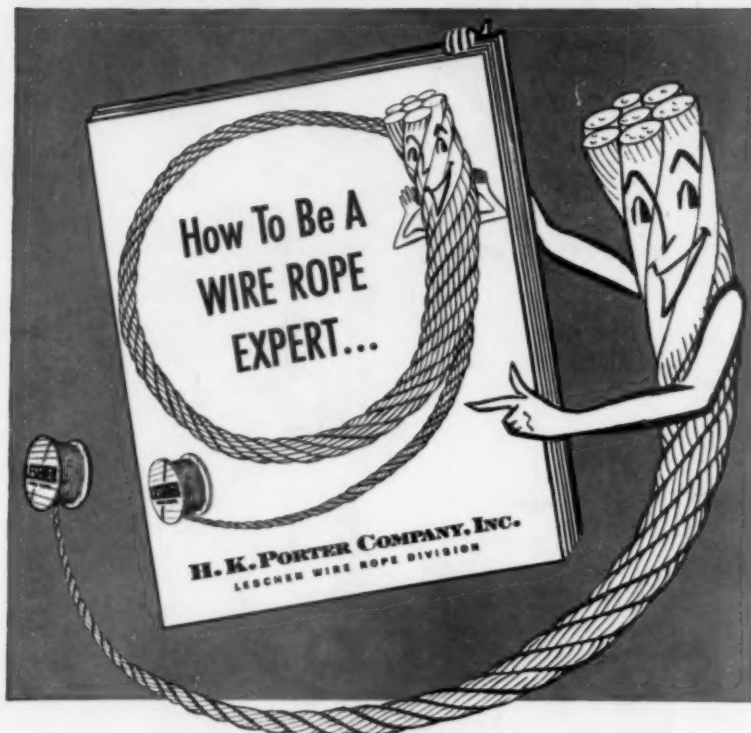
**OVERSTROM** **VIBRATING SCREENS**

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OVERSTROM & SONS, INC. • 2213 WEST MISSION RD • ALHAMBRA, CALIFORNIA  
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# know wire rope...

## send now for free 16-page guide



**Yours for the asking... Illustrated 16-page book of pointers on how to select the right wire rope for any job!**

Knowing how to select the best wire rope for the job not only helps reduce costs, but it may also help you to get that job done more efficiently. You'll find the facts you need to know in the book shown above. It has been specifically edited and illustrated for easy understanding by non-technical readers. It describes the forces that tend to destroy wire rope and then, step by step, shows how to determine which wire rope construction will provide the greatest possible resistance to the destructive forces you have found most troublesome. It's an interesting and helpful aid that every wire rope user ought to have. Send for free copy today. Write H. K. Porter Company, Inc., Leschen Wire Rope Division, 2727 Hamilton Ave., St. Louis 12, Missouri.



**H. K. PORTER COMPANY, INC.**  
LESCHEN WIRE ROPE DIVISION

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## INDUSTRY NEWS

(Continued from preceding page)

### Canadian potash firms are active

IN A FINANCIAL POST SURVEY of Canadian potash production, it was reported that 14 companies have under disposition more than 2 million acres in Saskatchewan. The first producer to begin operations will be Potash Co. of America. Its \$20-million, 4,000-tpd. plant at Patience Lake, near Saskatoon, is expected to be completed in November. The 3,300-ft. production shaft was finished last month, and work is proceeding on surface buildings and installation of equipment.

International Minerals and Chemical Corp., engaged in another \$20-million undertaking at Esterhazy, 150 miles east of Regina, expects to put it into operation next year. Plans are to have the shaft completed, surface buildings up and production started by late 1959 or early 1960.

Latest company to begin potash development is a German firm, Winsal of Canada, subsidiary of Castrop-Rauxel of West Germany. It has purchased two sites in the Melville and Yorkton districts.

### Awarded contract

NATIONAL INDUSTRIAL PRODUCTS CORP., Boise, Idaho, has been awarded a contract by Pacific Carbide and Alloys Co. to quarry and crush limestone at its quarry near Enterprise, Ore. Heavy-duty portable equipment will be used to conduct the quarry work on a batch basis during the summer months, and crushing will be done at the National Industrial quarry near Durkee during the winter. Coyote holes will be used for blasting; formerly the bench and down-hole method was used.

### Improvements planned for Medusa's Dixon plant

MEDUSA PORTLAND CEMENT CORP., Cleveland, Ohio, intends to improve shipping facilities at its Dixon, Ill., plant through construction of two bulk loading silos with equipment to weigh and load rail cars. The system, to be installed by Macdonald Engineering Co., will make it possible to load two rail cars in 10 minutes. This will permit better distribution of the plant's production, which as a result of recently completed expansion has risen from 1,500,000 to 2,500,000 bbl. per year.

(Continued on page 58)

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# **Euclid Rear-Dumps give you bonus benefits**



For 25 years Euclid has specialized in designing and building equipment for heavy, off-highway earthmoving. The dependable low cost performance of these "Eucs" has made them the standard of comparison for contractors, mines and quarries around the world. About 7 of every 10 off-highway Rear-Dumps are Euclids.

Although this unmatched experience may not be apparent when comparing specifications, it assures bonus benefits for Euclid owners—cost-cutting advantages not provided by comparable equipment. The greater use of Euclids results in faster complete field exposure to operating and maintenance characteristics under all conditions.

It assures advanced design that pays off in more work-ability and minimum downtime on the job.

With Euclid's larger machine population, it's economically possible for Euclid dealers to provide more complete service facilities and ready availability of all factory engineered replacement parts. It's factors like these that enable owners to keep their "Eucs" operating at peak efficiency with unusually high availability and low production cost.

When you're considering Rear-Dumps, get facts and figures from your Euclid dealer—have him show you why *Euclids are your best investment.*

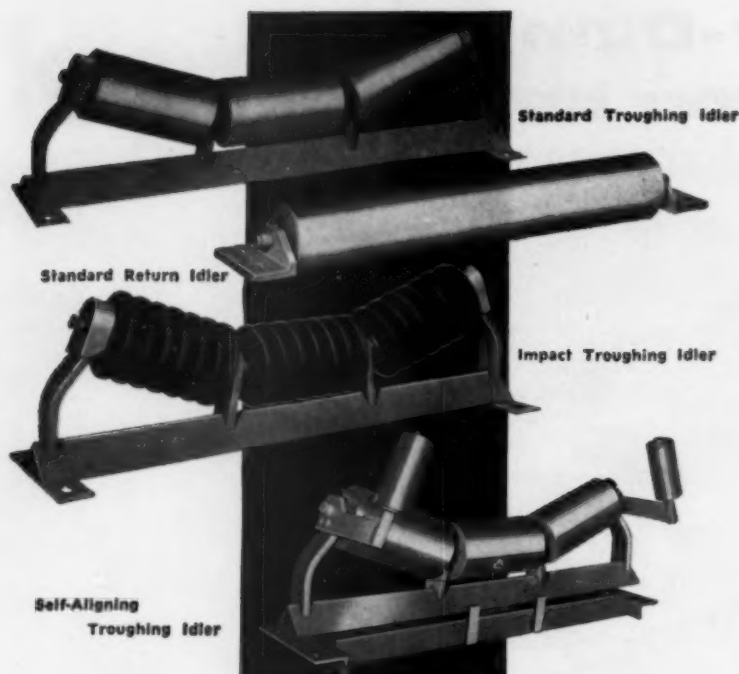
EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

**Your Euclid Dealer offers  
the best equipment investment**



## **EUCLID EQUIPMENT**

FOR MOVING EARTH, ROCK, COAL AND ORE



## MARCO belt conveyor idlers

**INCREASE PROFITS BY HANDLING  
GREATER LOADS AT LOWEST COSTS...**

The advanced engineering ideas incorporated in MARCO conveyor idlers will increase your production and lower your material handling costs.

For example, MARCO idlers have greater load capacity because they are designed with precision ground ball bearings, designed specifically for conveyor idlers. At 300 revolutions per minute, they will carry loads up to 860 lbs. per bearing. These anti-friction bearings give you added years of idler service life and lower power requirements.

**Less maintenance:** Pre-lubricated, effectively sealed bearings eliminate field lubrication. Self-shedding base keeps material build-up at a minimum. End and center brackets are  $\frac{1}{2}$ " thick steel, die formed, to eliminate breakage.

Why settle for anything less than the proven economy and efficiency offered by MARCO idlers? Units fit any conveyor frame and are available in many types and sizes. Ask for bulletin ID-2.

### MARCO—One source for all your Conveyor Needs

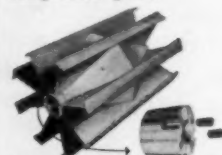
Whether you need a complete conveyor, or any conveyor accessory, there is a MARCO product to meet your exact requirements. By relying on MARCO—you save time, trouble and get more for your dollar.

Get the facts from your MARCO distributor or contact E. F. Marsh Engineering Co., St. Louis 10, Mo.

### Solid Steel Pulleys (all-steel, heavy-duty)



All MARCO pulleys offer the outstanding advantages of machined faces and Taper-Lock bushings—at a competitive price.



### Self-Cleaning (wing-type) Conveyor Pulleys

(Steel fabricated, jig welded)  
Pulley pays for itself many times in longer belt life by discharging 'mis-located' particles before belt can be damaged.

### engineered MARCO products:

Tubular Frame Belt Conveyors—Conveyor Idlers—  
Solid Steel and Self-Cleaning Steel Pulleys—  
Bucket Elevators—Control Gates—Feeders—Bins.

\*Trademark Reg.

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## INDUSTRY NEWS

(Continued from page 56)



### Tube mill for Iran

READY FOR ITS JOURNEY to Iran from Sheffield, England, this 8 x 45-ft. tube mill was part of an order for complete plant machinery. Because of its size, the mill was dismantled for shipment, and trunnion ends, gears, etc., were sent separately. Final destination of the equipment was Douroud, Iran, via the Port of Khorramshahr in the Persian Gulf.

### Water reclamation system at sand, gravel plant

ELMHURST - CHICAGO STONE CO., Elmhurst, Ill., completed construction in mid-May of a water reclamation system at its Warrenville, Ill., sand and gravel plant. The system eliminates the need to pump sizable amounts of water from its 266-ft. well. This well will be used only occasionally to replace water in settling basins lost by seepage or evaporation, according to John T. Gray, plant manager.

Water used to wash the gravel is pumped after use to a 4-acre, 15 ft. deep primary settling basin. Dirty deposits sink to the bottom and cleaner water at the surface flows into a secondary basin where more sediment is removed. The water then is returned through a 24 in., 1600 ft. long culvert to the washing plant where the operation is repeated.

### New aggregates plant

SOUTHWEST CONCRETE MATERIALS CORP., Little Rock, Ark., has constructed the second of three projected plants—a lightweight aggregates plant at Poyen, Ark. The first facility, completed last spring, was a sand and gravel plant, producing three grades of gravel and sand.

### Moves Vancouver office

BRITISH COLUMBIA CEMENT CO. LTD., Victoria, B.C., announces a new address for its Vancouver office: 540 Burrard St., Vancouver, B.C., Canada.

(Continued on page 61)

# Here's EXTRA STABILITY for EXTRA PRODUCTION ... Greater Operator Comfort

Ratio of Wheelbase to Length is  
Higher on the **TL-20D TRACTO**LOADER®

## Another example of Tractomotive common sense design

Here is the kind of stability you need for high-production digging and for moving full buckets fast over rough or hilly ground. No loss of power and traction getting loads ... no tipping and spilling traveling with loads.

That's because the 7'9" wheelbase on the TL-20D is up to a foot longer than on comparable loaders ... and the length with bucket at carry is a compact 18 feet.

This makes the TL-20D wheelbase 43 percent of over-all length with bucket at carry — well above other loaders.

This EXTRA STABILITY is one more reason why you get EXTRA PRODUCTION with the TL-20D. Here is another Tractomotive design difference that makes a performance difference — and a profit difference!

There Is A Fast-Working TRACTOLOADER To Fit Every Job — 5 Models — ½ cu yd to 2¼ heaped ... two and four-wheel drive.

CAPACITY — 2¼ cu yd heaped  
WEIGHT: 22,100 lb  
100 diesel hp

**TRACTO** — a sure sign  
of modern design



SOLD AND SERVICED BY YOUR ALLIS-CHALMERS CONSTRUCTION MACHINERY DEALER



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## Sit down... move in... drill... drive on with Gardner-Denver Deluxe "Air Trac"



... everything you need for fast, effortless blast hole drilling is at your finger tips. Centralized hydraulic remote controls give instantaneous command of all operations. You can swing, lift and lower drilling mast into position... drill... and drive crawler tracks without getting off the rig.

Gardner-Denver DPAT hydraulic drill positioner provides 132° swing, 360° dump. You'll have an 86° T-bar lift. All vertical, horizontal and flat lifter holes

can be completely power-positioned. The hydraulic system is creep-free, maintains alignment at all drilling angles, avoids stuck steel.

Deluxe "Air Trac"® is equipped with hard-hitting, fast-acting DH123 (4½") or DH99 (4") drill... free-wheeling drive shaft for towing... toolbox for tool, bit and coupler storage. Climb aboard and test the Deluxe "Air Trac" at your nearest Gardner-Denver distributor's today.



ENGINEERING FORESIGHT—PROVED ON THE JOB  
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

# GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario



## INDUSTRY NEWS

(Continued from page 58)

### Ruling denies sand is mineral

IN A DECISION handed down by Circuit Judge Howard L. Campbell at Cadillac, Mich., the phrase, "oil, gas and other mineral," found in certain mineral deeds does not include sand, gravel and stone. The ruling was made in a suit brought by Mr. and Mrs. Leo Dunbar against Mr. and Mrs. Leon McFall. The plaintiffs claimed the word "minerals" included sand, gravel and stone, and gave them the right to mine gravel from the land.

Judge Campbell ruled the meaning of the words "other minerals" was confined to minerals of like kind and character, "such as helium gas or drip gasoline" but did not include dissimilar substances like sand and gravel.

### Lowers quarry floor

CHEMSTONE CORP., Cleveland, Ohio, has made an experimental cut in the floor of its Marblehead quarry in a plan to utilize the commercial grade stone underlying the high calcium fluxstone. This program would lower the depth of digging operations from 20 to 60 ft. and extend the life of the plant.

Some of the stone will be tried as fluxstone in steel making, and if successful, would give the quarry two markets: steel and construction.

### South Dakota plant expands



SOUTH DAKOTA CEMENT PLANT, Rapid City, S.D., is adding to its facilities. Construction currently underway is for six slurry storage tanks atop the plant's new chemical laboratory. Reinforcing steel weighing 82 tons has been placed in the 5-ft. thick ceiling to support the load of the tanks which will have a combined capacity of 12,000 bbl.

The South Dakota plant, only state-owned cement plant in the U. S., will have a 3,300,000-bbl. annual capacity on completion of its third, 900,000-bbl. kiln in 1959.

(Continued on page 63)

## HUBER-WARCO grinders



### low cost aggregate reduction

If you want low cost aggregate production, then get all the facts on the Huber-Warco No. 9 GRINDER. Quickly and efficiently, this grinder reduces cinders, pumice, slag, haydite, burned clay, shale and many other products of quarries and mines. Here are some profit-producing facts . . . capacity of 30 yards per hour . . . grinds material wet or dry . . . horsepower required is 25 h.p. . . . 150 r.p.m. speed of 48" clutch pulley . . . floor space of 12'-8"x11'-2" . . . overall height of 10'-11" . . . weight is 31,000 pounds. Suspended yoke mounted mullers are adjustable to any height, and for finer grinding, the grinding surfaces run together. The No. 9 GRINDER requires only a minimum of maintenance for continued trouble-free service. Other Huber-Warco GRINDERS range in capacity from 4 to 75 yards per hour . . . write for complete details.

**A product of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.**

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.

☐ Please send me specifications on the Huber-Warco No. 9 Grinder

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



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## Do you get service like this?

USS Rolled Plate Lining mills  
1,000,000 tons of gold-bearing  
ore before being replaced

HOMESTAKE MINING COMPANY,  
Lead, South Dakota, grinds gold-  
bearing quartz, two-thirds of the  
ore being of unusually hard rock.  
The ball mill produces a grind to  
pass 65% through 200 mesh.

Recently, the #2 unit in the ball  
mill was relined and performance of  
the previous 26-month-old USS  
Rolled Plate Lining was evalu-  
ated. The heavy lining consisted of  
24 tons of 3" plate and 5" lift bars. It  
was in operation 773.75 days and  
milled 1,051,034 tons of ore, an aver-  
age of 1,358 tons per operating day.

Because USS Rolled Plate Linings  
are made of *rolled* steel, they have  
superior toughness. Lift bars are  
rolled alloy steel and heat treated to  
obtain extra hardness and toughness  
through the lift portion of the lining.  
Both plates and bars are made to  
close tolerances for snug fit.

Our technical personnel will be  
glad to advise on any tough grinding  
problem.

Original lift was 2 1/4". Lift remaining at re-  
placement measures a full 2". Liner plates  
are worn to less than 1/4" in the valleys. There  
was no evidence of breakage in either plates  
or bars.

United States Steel Corporation - Pittsburgh  
Columbia-Geneva Steel - San Francisco  
Tennessee Coal & Iron - Fairfield, Alabama  
United States Steel Export Company



## United States Steel

## INDUSTRY NEWS

(Continued from page 61)



### Film explains cement making

CALAVERAS CEMENT CO., San Francisco, Calif., has produced a color film, "Penny a Pound," which follows the cement manufacturing process from quarry to finished product. Inspecting a print of the 16 mm. film are Grant W. Metzger, left, plant manager, and Gardner W. Mein, assistant to the president.

Beginning with a 100,000-ton blast in one of the Calaveras quarries, the film's action continues in the cement plant and follows the product to its ultimate use. It stresses the human side of cement making, showing typical employees at home as well as in the plant.

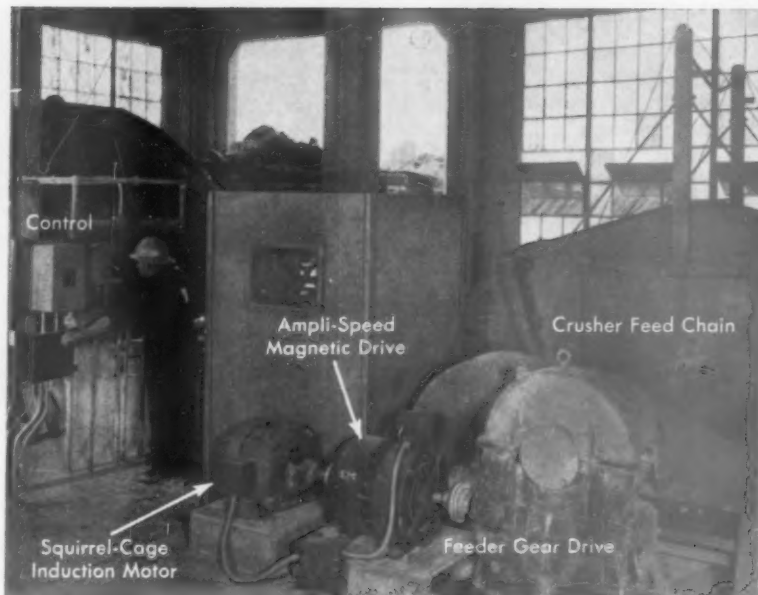
The title of the film is based on the fact that cement is the lowest priced building material on the market, delivering for less than a cent per pound. "Penny a Pound" is available on free loan to any organization in northern and central California. Inquiries should be addressed to Calaveras Cement Co., 315 Montgomery St., San Francisco 4, Calif.

### Set safety record

NEW YORK TRAP ROCK CORP., West Nyack, N.Y., announced that employees at its Tomkins Cove plant have set a record high in its safety incentive program by completing 600,000 man-hours without a lost-time accident. Under the rules of the program, an award of \$2,000 will be shared by the 125 men at the plant on the basis of the number of hours each has worked during the past 100,000 man-hours.

This is the first time that any of the company's five installations has completed six consecutive periods without a lost-time injury on the job since the incentive plan was started about three years ago. The last lost-time accident at Tomkins Cove was in September, 1955. Men working there have shared a total of \$8,000 in cash awards since that time.

(Continued on following page)



## CEMENT COMPANY STEPS UP CRUSHER OUTPUT 10%

***Stops overloading by automating feeders with E-M AMPLI-SPEEDS***

**PROBLEM:** "How to keep hammermill crushers fully loaded without overloading?" That was the problem facing operators of a large midwest cement plant.

Crushers were severely overloaded when heavy concentrations of rock were loaded onto the traveling feed chains a carload at a time. And to make matters worse, the steadily moving feeders kept right on feeding the already overloaded crushers. Yet, in between carloads the crushers were underloaded because the wound-rotor motors driving the feed chains were kept at their lowest speed to minimize overloading.

**SOLUTION:** Mill engineers replaced the wound-rotor motors with 20 hp, 1750 rpm squirrel cage induction motors they had in stock and installed E-M Ampli-Speed Magnetic Drives between the motors and the feeder gear drives. Simple control

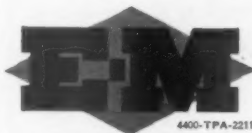
circuits were devised by putting a current transformer in each crusher motor power circuit and feeding its output through a rectifier to the Ampli-Speed Control.

**RESULT:** Now when crushers start to overload, motor line current signals the Ampli-Speed to stop the feeder. When the threatened overload passes, crusher motor line current drops and the feeder moves forward. This automatic start-stop action of the E-M Ampli-Speeds keeps the crushers fully loaded but never overloaded. Time saved between carloads by the increased speed of the feed chains has stepped up output 10%.

Do you have a speed control problem? ... Ask your nearby E-M speed control expert for help. He will be glad to give you details about precise, adjustable control with Ampli-Speed. Also, write the factory today for Bulletin No. 1140-RP.

*Somewhere in your plant an operation can be improved with smooth, adjustable speed control...*

**DO IT YOURSELF WITH AMPLI-SPEED**



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**ELECTRIC MACHINERY  
MFG. COMPANY**

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ROCK PRODUCTS, July, 1958

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63

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## INDUSTRY NEWS

(Continued from preceding page)

### TV enables skip tender to avoid spillage

CANADIAN JOHNS-MANVILLE CO. LTD., Asbestos, Quebec, has installed a closed circuit television camera and receiving set at the No. 1 main shaft of its Jeffrey Mine. The camera was placed 20 ft. in front of the two skip dumping locations on the surface, and the monitor is located at the loading station below. The two units are connected by 1,000 ft. of coaxial cable. Another monitor and camera control are in the lamp room on the surface; these are used to adjust the equipment.

The skip tender, at the 940 ft. level, now sees on his screen the 12½-ton capacity skip rising into dumping position, the skip door lifting, and the ore being discharged. If any irregularities occur, he can stop the skip, preventing any serious damage or spillage.



**Board of directors of Empire State Sand, Gravel and Ready Mix Association.** Seated, l to r: Harold A. Putnam, Putnam-Hawley Building Materials Co., Potsdam; John B. Hopkins, Albany Gravel Co., Albany; Tom Moogan, Moogan Sand & Gravel, Friendship. Standing: Paul R. Smith, executive secretary; Melvin Becker, Pine Hill Concrete Co., Buffalo; Edward J. Nunan, Buffalo Slag Co., Buffalo; Henry H. Kirwin, Eastern Rock Products, Utica; Harry A. Barney, Barney & Dickenson, Vestal; George R. Krom, Windsor Building Supplies, Newburgh; Charles C. Wing, Charles R. Wing Co., Albany

### Work on zoning credited as 'most far-reaching'

THE WORK DONE BY New York's Allied Industry Legislative Committee on matters of zoning, performance standards and land rehabilitation was credited as being "a most far-reaching

contribution" to the industry by Paul R. Smith, executive secretary of Empire State Sand, Gravel and Ready Mix Association, in his annual report May 12.

The group held its seventh annual convention in Syracuse May 11-13. Leon H. Wendel of the Empire State association is a member of the Allied Industries Legislative Committee, which is doing exemplary work on maintenance of aggregate deposits "in the face of rapid depletion and restrictive zoning and performance standards," according to Mr. Smith.

Another point stressed by the executive secretary was the necessity of every producer's developing favorable public relations by reducing to a minimum those operations which tend to arouse public displeasure. He also urged development of new markets through well-planned sales and promotional work with architects, engineers and state and city engineers.

The program featured talks by Mr. Wendel and a resume by Joseph J. Cardamone, Jr., a Utica attorney, on the New York State Lien Law.

Elected for the year 1958-1959 are the following officers and directors: George R. Krom, Sr., president; Harold A. Putnam, vice president; Harold Keahon, secretary; Richard M. Burgess, treasurer; Robert L. Finewood, director of district 4; William F. Maginn, director of district 7; Everett Spoor, director of district 8; and Harold A. Bundy, director of district 9. Associate members elected Mark Woodward of Master Builders Co. as chairman to succeed Charles C. Wing.

### New incorporation

SCHOENBRUNN SAND AND GRAVEL CO., New Philadelphia, Ohio, filed articles of incorporation with the Ohio Secretary of State. Donald Skinner was listed as agent.

(Continued on page 69)

## Calendar of Coming Conventions

### July 21-22, 1958—

Expanded Clay and Shale Association, Midyear Meeting, Cosmopolitan Hotel, Denver, Colo.

### July 23-25, 1958—

National Crushed Stone Association, Semi-annual Meeting, Board of Directors, Homestead, Hot Springs, Va.

### September 17-19, 1958—

Rocky Mountain Minerals Conference (AIME), Salt Lake City, Utah.

### September 22-25, 1958—

American Mining Congress, 1958 Metal Mining and Industrial Minerals Convention and Exposition, San Francisco, Calif.

### Sept. 30-Oct. 2, 1958—

National Sand and Gravel Association, Semi-Annual

Meeting, Board of Directors, The Tropicana Hotel, Las Vegas, Nevada.

### October 9-11, 1958—

National Lime Association, Fall Operating Meeting, Hotel Cleveland, Cleveland, Ohio

### October 16-18, 1958—

Empire State Sand, Gravel and Ready Mix Association, Fall Conference, Concord Hotel, Kiamesha Lake, N.Y.

### October 21-22, 1958—

National Slag Association, 41st Annual Meeting, The Mayflower Hotel, Washington, D.C.

### October 23-25, 1958—

Mid-America Minerals Conference (AIME), St. Louis, Missouri.



**Look ahead...*move ahead*...and stay ahead  
with Allis-Chalmers**



**... the construction machinery  
that keeps your production rolling**

**YEARS AHEAD IN DESIGN**

**extra performance**

**unequalled dependability**

**...backed by qualified dealer service**



# Your Allis-Chalmers Dealer is a Specialist in

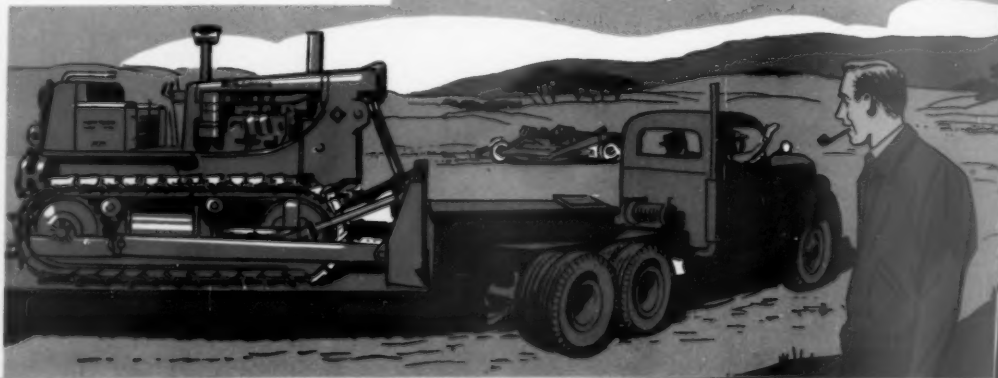
**Y**our Allis-Chalmers dealer *knows* the equipment he sells. He can give you the expert service in shop and field that results in "like-new" performance from every Allis-Chalmers unit in your fleet . . . keeps them producing on your jobs.

Add the availability of Allis-Chalmers parts—made in the same factory, to the same rigid specifications as original equipment—and you have a program built to maintain top performance, long equipment life, low job costs for you!

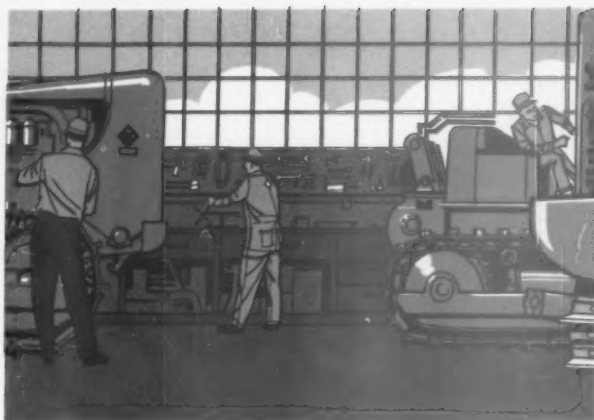


Careful pre-delivery servicing assures that Allis-Chalmers construction machines have been thoroughly rechecked . . . and that they're ready for work as soon as you get them.

Detailed information on maintenance, adjustments and other facts on care of the machinery is delivered with the equipment. Operating tips are passed along to your men—to help them get started right and get the most from their equipment.



# Service



Shop service at your Allis-Chalmers dealer is fast and efficient—because it's handled by factory-trained men, using factory-approved tools, equipment and methods. Specialized mechanics and special facilities all help to speed service.



Scheduling checkups with your Allis-Chalmers dealer will insure that proper maintenance procedures are followed . . . stop trouble before it starts . . . keep your machines producing.



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there's more »  
to this »  
Important story... »

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**ALWAYS READY TO ROLL...**



**... with qualified service ... original specification parts**

**ENGINEERED RIGHT**

Allis-Chalmers parts are designed as original equipment ... benefit from intensive metallurgical research. And each comes from the drawing boards of experienced construction machinery engineers.

**MANUFACTURED RIGHT**

Precision-made parts assure long-life service. They're made by skilled craftsmen on modern industrial machinery and are subjected to original-equipment inspection and testing.

**TO PERFORM RIGHT**

Each part is made of top-quality material, heat-treated to correct hardness and made to exact specifications. You can depend on them for full-capacity production on the toughest jobs you have.

*The men of your Allis-Chalmers dealer organization know local conditions. Look to them for equipment recommendations to fit your job requirements ... for true value in used machinery.*



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## INDUSTRY NEWS

(Continued from page 64)

### Crushed stone plant to supplement production

CALLANAN ROAD IMPROVEMENT Co., South Bethlehem, N. Y., will construct a \$2-million crushed stone plant near Newburgh, supplementing production at its South Bethlehem and Kingston plants, said J. Reid Callanan, president. The company's announcement to proceed with construction of the plant followed legal action in which its right to operate a quarry and plant in Newburgh was upheld by an Appellate Court decision. The company purchased the 125-acre tract containing extensive deposits of dolomitic limestone four years ago.

### Closes limestone plant

NATIONAL GYPSUM Co., Buffalo, N.Y., has closed its Luckey, Ohio, limestone plant. According to John C. Downey, plant manager, the plant, including about 200 acres of limestone deposits, will be sold.

### Portland cement production

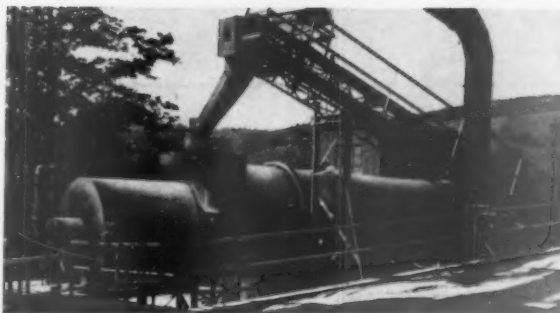
PRODUCTION OF FINISHED portland cement in March, 1958, as reported by the Bureau of Mines, totaled 17,856,000 bbl., a decrease of 21 percent from March, 1957. Mill shipments during the month totaled 17,370,000 bbl., a 15-percent decrease compared with March, 1957, while stocks on hand March 31, 1958 were 36,668,000 bbl., 7 percent more than on the year-earlier date.

Clinker production during March, 1958, totaled 21,816,000 bbl., a decrease of 15 percent from the March, 1957, figure. The production figures were supplied by 150 plants (excluding 14 inactive plants) in 37 states and Puerto Rico.

### Medusa sells land for wildlife area

MEDUSA PORTLAND CEMENT Co., Cleveland, Ohio, has agreed to sell 802 acres of land to the Ohio Department of Natural Resources. The land borders on the Resthaven Wildlife area near Castalia, Ohio. Sale price of the land is \$1 per acre, and a clause in the agreement permits the cement company to remove marl from 40 acres without charge. An option is included for removal of marl from remaining acres at a cost of \$350 an acre.

END



7'0 x 30'0 oil heated rotary dryer removes excess moisture.

Unique cup shaped lifters are staggered in the unit to assure even distribution of the sand particles, resulting in greatly increased capacity and efficiency of the dryer.

A McDermott Dryer Installation at the North American Refractories Plant, Little Gap, Pa.  
Sound Engineering Economy  
and Consistently Superior Performance  
are built into all McDermott



Dryers . Coolers . Kilns  
**McDERMOTT BROS. CO.**  
Allentown Pennsylvania  
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## This BROOK A.C. MOTOR is a Weather Profit!



Peak performance in all climates—humid or arid—high or low temperatures. You profit in any weather with this husky, totally enclosed, fan cooled BROOK MOTOR. Yet, it actually costs less than an ordinary, light duty motor. Slip Ring or Squirrel Cage type, 1 to 600 H.P., ready for shipment from warehouse stocks in major industrial centers. Send for brochure and name of your local Brook Dealer.

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ROCK PRODUCTS, July, 1958

# HINTS AND HELPS

Profit-making ideas developed by operating men



## Use for old drill steel

MOST USED DRILL ROD is usually piled out of sight until it is gathered for scrap or just rusts away. Here is the way an enterprising rancher built a sturdy, low cost enclosure, using drill steel he gathered from mines and quarries in his locality. The rod varied from 1 to 1¼-in. and from 5 to 10 ft. long, but it was simple to cut the pieces to length and to drill the posts for the right diameter. *Courtesy Compressed Air Magazine.*

## To the rescue

WHEN A SOUTHERN AGGREGATES producer wanted to pour new footings and foundations for new equipment during the winter he discovered that the ground was too soft to support ready-mix trucks or pouring rigs. A flash of inspiration led the plant engineer to devise a pouring bucket that could be fitted into the bucket of a tractor shovel. The bucket could be

easily lowered into position to take concrete from the trucks and could be elevated to discharge into forms well above ground level. The tractor shovel had large enough tires to provide plenty of bearing in the soft ground even when carrying a yard of concrete.

## Vibration control



THE TREND FOR CENTRALIZED control and one-man operation of sand and gravel plants has brought several operating problems. One of these is the problem of vibration in the tops of structural steel towers where the control panel is usually placed.

One western aggregates producer practically eliminated vibration in the control panel at the top of a steel tower by mounting the whole control room on rubber vibration pads. The corrugated steel housing encloses the entire room, which is supported by 2½ in. thick rubber mounting pads.

tionally more service units; if slower, then less than one unit per hour.

Revolution counters are not limited to diesel or gasoline engines. When applied to the rotating parts of other machinery they give an excellent indication of the rate of wear of vital parts. The counter itself must be protected and maintained; but given good service it performs a valuable function which can pay its cost in maintenance savings many times over.

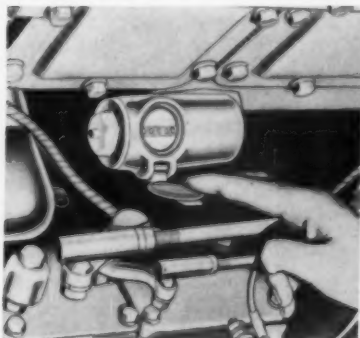
## Versatile tractor



IT SEEMS THAT some pieces of equipment can do almost anything around a rock products producer's plant. This tractor-shovel not only maintains stockpiles, loads out material and helps to keep the plant clean for a southern producer.

In its spare time, the shovel hustles empty and loaded railroad cars, shuttling them around the plant wherever they are needed. Using a special hook attachment for rail cars, the tractor can haul and spot the cars with the greatest of ease in any kind of weather or track condition.

## Servicemeters tell when maintenance is needed



ONE OF THE MOST USEFUL gadgets to take the guesswork out of maintenance scheduling on engines is the servicemeter. This is a revolution

counter which gives engine operators an accurate measure of engine operation, and an indication of the wear on parts which must be inspected, serviced or changed periodically. Economy-minded owners and maintenance men have tied maintenance and service procedures directly to the readings of servicemeters, and they have specified these counting devices as a standard part of every new engine.

The servicemeters supplied by one major manufacturer have a built-in timing device. The meter is calibrated to the "normal" operating speed of the engine and indicates one service unit for each hour at this speed. However, if the engine is operated faster than standard, the unit clocks propor-

## Unload low-side gondolas

QUITE A VOLUME of rock products are shipped in low-side gondolas, and for those who do not have clamshell cranes, unloading the car may be a problem. One eastern concrete products manufacturer eliminated the 10 men who took two days to unload each car by using a tractor loader.

It is essential to be able to back a truck carrying the tractor shovel right up to the top edge of the rail car so that the tractor can drive onto the loaded car. After the car is empty he uses a pair of steel runways to drive the tractor out of the car and back into the truck.

(Continued on page 72)



AIR HOSE

Would you use this



for this?



Then why pay extra for heavyweight, muscle-bound air hose, when U. S. Rubber Air Hose is easier to handle, more flexible, and withstands higher working pressures...at lower end cost.

When you're on a tight budget and a tight schedule, there's no sense in throwing dollars away buying overweight, hard-to-handle air hose. Such hose—with excessive, unnecessary plies—is out of date, will slow you down, and leave you out of pocket.

Now, thanks to "U. S." engineering, you get the optimum balance in air hose—easier to handle *and* at the same time tougher and less expensive. What's more, U. S. Air Hose handles higher working pressures than

the conventional air hose you might be using.

Every hose in the complete "U. S." line is designed to give maximum service, even under unreasonable demands. Take advantage of the skill and long experience of "U. S." Hose technicians, plus "U. S." research and production facilities. Get U. S. Air Hose at your local authorized "U. S." Hose Distributor, or write us at Rockefeller Center, New York 20, New York. In Canada: Dominion Rubber Co., Ltd.



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ROCK PRODUCTS, July, 1958

## HINTS AND HELPS

(Continued from page 70)



### Screw conveyor replacement

SOME SECTIONS of screw conveyor seem to wear more rapidly than others, particularly those pieces under loading chutes, at transfer points, and feeder screw sections. Replacement of these sections when worn has always been a major maintenance headache, for the whole line of conveyor had to be dismantled to get at a section in the middle of the conveyor. This often disturbed the careful factory alignment of hangers and trough ends, and heavy sections of conveyor had to be lifted out of the troughs.

Screw conveyor sections have been designed which can be uncoupled from the conveyor and lifted out of the trough without disturbing the adjacent sections, their couplings or hangers. Short sections can be made which are light enough to be lifted into place by one man, and unassisted, he can make the necessary replacement of screw conveyor which may wear more rapidly than the whole line.

### Storage battery care

THE CARE AND ATTENTION to storage batteries is just as important to the rock products producer in the middle of summer as during the inactive periods of winter. Heavy use and improper maintenance reduce a battery's life, often producing failure at an inconvenient time.

Some points of attention recommended by Caterpillar Tractor Co. include: Periodic check of the level of liquid in the battery—filling only to the manufacturer's mark. A battery that requires water more than once every two weeks is being overcharged: the voltage regulator should be checked.

Cleanliness is important. A build-up of corrosion can discharge the battery

and short-circuit it. Terminals should be wire brushed and coated with petroleum jelly or rubber cement. An occasional washing in a baking soda solution will prevent the accumulation of acid on the outside of the battery case.

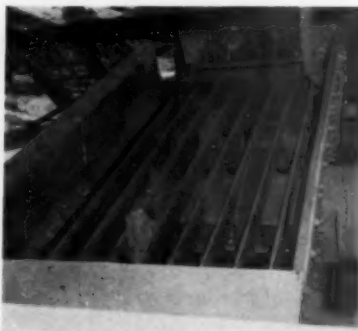
Batteries should be kept charged at all times. A completely discharged battery has an internal build-up of material which cannot easily be removed in charging. Batteries in storage should be checked regularly and recharged to keep them at full strength and ready to use.

### Belt guides



HOMEMADE AND HANDY is this set of belt guide idlers devised by a western sand and gravel producer to keep the belt centered on the carrying idlers. Each idler roll was taken from the stand of a set of carrying rolls, and mounted in a frame of steel angles. A crossbar above the belt not only braces the guide idlers, but acts as a belt hold-down during a wind-storm as well.

### Heavy screen



WHEN HEAVY LIMESTONE had to be scalped out to make blast furnace feed at the quarry of this western rock producer, a heavy vibrating screen was selected. The screen was fitted with tapered steel bars to make a rugged, nonclogging vibrating grizzly.



### Pile separators

TO KEEP THE MATERIALS at the toes of his storage piles apart, a western producer used large diameter corrugated steel pipe. This technique proved to have unexpected convenience for the workmen who used it as a passage-way through the piles rather than going the long way around to the other side.

### Portable welder



A WESTERN PRODUCER has equipment all over the great outdoors which frequently needs welding repairs, hard-facing or cutting. Rather than go to the trouble of dismantling and hauling the parts long distances over rough terrain, he devised this welding machine on the body of a truck.

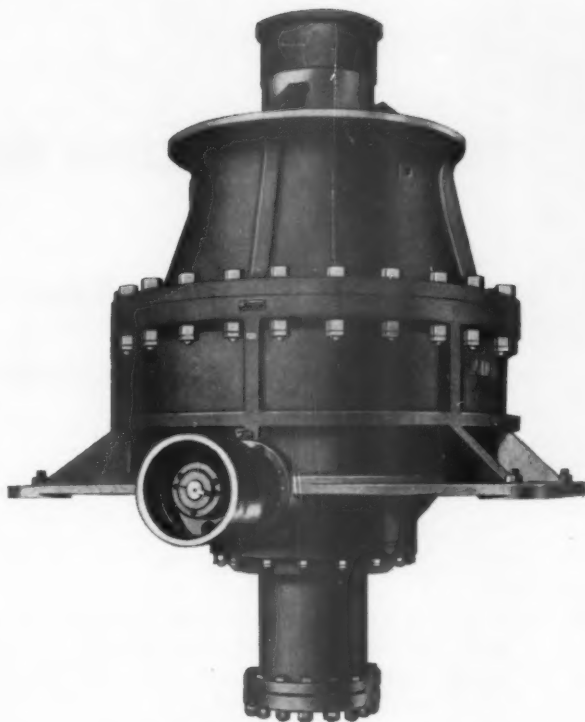
Now he can go right to the machine needing attention and do the work on the job. The short boom on the end of the truck can be used with a chain hoist to lift and hold the work while it is being welded.

### Protects screw conveyor

NOT NEW BUT SELDOM SEEN is a high level indicator which protects a screw conveyor from an overload which might burst the cover or surge the conveyors beyond it. The device is necessary to prevent cement dust from aerating and increasing in volume enough to jam the equipment. A mid-western cement manufacturer installed this device which will sense any build-up of pressure within the vapor-tight conveyor trough, and will sound the alarm to the operator to cut the feed.

END





**Bonus capacity,  
superior quality  
with Hydrocone  
Crushers**

**Y**OU can gain extra hours of production each time you change a setting in the *Hydrocone* crusher. Just flip a switch, and in *less than a minute* the *Hydroset* mechanism raises or lowers the crushing cone for precise control of product size. Equally important, you get superior quality stone to meet rigid specifications. Crushing chamber design and choice of eccentric throws assure uniform cubical characteristics and even distribution in all mesh sizes.

**Adjusts for wear, clears tramp iron  
and releases jams**

"One-man, one-minute" operation also applies to compensating for wear on mantle and concave, and emergency unloading — just flip the switch to raise the mainshaft. In addition, you get protection against tramp iron or other uncrushable materials with an automatic reset in the hydraulic system.

To get all the details on the fastest and most efficient crusher operation, ask your A-C representative for Bulletin 07B7145B. Or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

# Crushing Specification Stone?



Hydrocone and Hydroset are Allis-Chalmers trademarks.



A-5593

## ALLIS-CHALMERS



## You can do

*A producer*

*in his area*

**F**OR THE PAST TEN YEARS, many American railroads—through repeated increases in freight rates—have been pricing rock products producers right out of rail transportation. Over the last decade, the percentage of sand, gravel and crushed stone moved by rail has decreased from 27.5 to 14.6 percent, and it continues to decline even more rapidly every day—even though these industries still ship or receive one-tenth of all carload-lot traffic. This is one of the most serious problems facing the rock products industries today; neither the railroads nor the rock products producers can afford to dissolve this profitable business relationship. Unhappily, though, some railroads don't seem to realize it.

The problem has become especially acute in the last two years, during which the Interstate Commerce Commission granted the rail lines three substantial increases in freight rates. All of these were vigorously, intelligently—and unsuccessfully—opposed by the National Sand and Gravel Association and the National Crushed Stone Association. Several months ago, Ellis E. Jensen, president of the Janesville (Wis.) Sand and Gravel Company climaxed many years of research with a thoughtful document questioning the accuracy of the figures on which the ICC based the rate increases. Is this enlightened opposition having any real effect on the ICC or the railroads? What is the future of the association between rail transportation and the rock products industries? To answer these questions, I talked with a number of officials in Washington as well as with Mr. Jensen and representatives of the industries affected.

There is evidence that these efforts are beginning to pay off, that both the carriers who have sought the rate increases and the ICC officials who approved them are going to take a second look.

It may be a long hard pull, and the successes may be spotty and irregular. But those who have fought this battle on behalf of the rock products industries deserve a great deal of credit for refusing to accept what seemed to be a foregone conclusion: that the railroads are irrevocably convinced that sand and gravel in general and short haul traffic in particular cannot provide them a sufficient return at a rate low enough to continue to attract this type of business.

In establishing freight rates, most railroads—instead of finding out for themselves what pays and what doesn't—take the easy way out by depending on statistical data turned up by the ICC. The yardstick used most frequently by the railroads is a list, prepared by the ICC, rating commodities by the degree to which they supposedly pay their own way on the freight lines. Sand and gravel stands out like a sore thumb—because of its still large volume—among the 10 worst deficit contributors to railroad revenues.

If these figures are to be believed, then the railroads can hardly be blamed for pushing sand and gravel business away. But a great deal of evidence has now been gathered to show that the ICC computations—and the interpretations offered by the Cost Finding Section from them—are in gross error. If so, the basis on which railroads are trying to get rid of rock products business is all wrong, and they are throwing away what could be a solid profit maker for them. This is the really unhappy part of the whole situation. The rock products producers who are raising their voices ask only that the railroads make their own private investigations with cost accountants and set their rates as a result of these findings and not on the basis of ICC statistics open to attack from many sides.

# something about rising freight rates

***—Ellis Jensen—was able to prevent a rise in rates  
and set a pattern that you, too, can follow***

By JOSEPH N. BELL

One of the most enlightened individual voices in this battle in recent months has been that of Ellis Jensen. The ICC is still a little groggy over the flank attack from Mr. Jensen; apparently they've never had to cope with the likes of him before. And it will offer them no satisfaction at all to know that they aren't through with him yet.

Mr. Jensen is one of those rare people who reads and understands statistics, and then has the vision and intelligence to apply them to a business situation; as a matter of fact, he has been receiving, analyzing and cataloguing ICC statistics on freight movements since the end of World War II. His primary motivation was enlightened self-interest. The Janesville Sand and Gravel Company depends almost entirely on the railroads for transportation; when rail rates go up, Jensen's business goes down.

"There are two main elements involved in marketing sand and gravel," points out Ellis Jensen, "producing and transporting it. Considerably more than half of its cost at the point of usage is tied up in transportation, yet we producers spend most of our time and energies in working to cut down production costs. I decided to look into the possibilities of cutting transportation costs—and the closer I looked at the ICC's figures, the more apparent it became to me that the whole sand-and-gravel industry has been seriously hurt by some very dubious cost studies. So, I decided to do something about it."

At the Wisconsin state capitol last year, Mr. Jensen made an impassioned and thoroughly documented objection to the raising of intrastate freight rates on sand and gravel. He showed statistically that rail carriers weren't losing money on sand and gravel, that indeed they were making money and that further increases would serve to

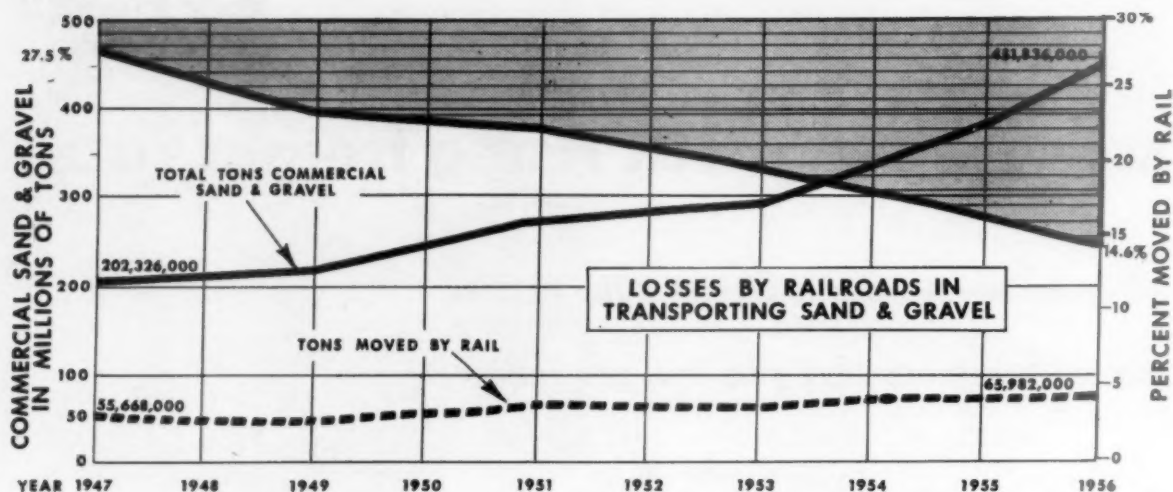


"Mr. Jensen is one of those rare people who reads and understands statistics . . ."

drive off business and hurt rather than help the financial plight of the railroads. He won the case, and the increase on sand and gravel shipped within the state was denied by the Wisconsin Public Service Commission.

Vincent Ahearn, Executive Secretary of the National Sand and Gravel Assn. liked the presentation so well, he asked Jensen to give a similar talk on the national situation at the NSGA annual meeting. Not one to take such an assignment lightly, Jensen journeyed to Washington on his own hook to delve into ICC figures and methods firsthand. He talked first with ICC Chairman Freas, who pointed out: "You don't expect the railroads to carry sand and gravel at a loss, do you?" When Jensen said they weren't and he would prove it, Commissioner Freas told him to go ahead and send him the evidence. Mr. Jensen has apparently done both.

He spent a week poking around ICC offices, talking with statisticians, collecting figures, and questioning cost finding officials. When he returned home, he set about collating his figures to find out



Information for these tables comes from Mr. Jensen's talk, "More Short Haul Traffic," given at the 42nd. annual convention of the National Sand and Gravel Association in Chicago on February 12, 1958.

## Rising freight rates

continued . . .

what sort of picture they would present. Most of you have seen the results in the booklet "More Short-Haul Traffic" published by the NSGA. In this publication (based on his speech at the NSGA meeting last winter), Mr. Jensen shows statistically that the ICC cost studies on which the railroads' rate structure and attitudes toward sand and gravel traffic are based are grossly inaccurate; that the costs of moving sand and gravel are overestimated by as much as 75 percent; that short-haul traffic, almost abandoned by the railroads as economically unfeasible, could be a profitable source of revenue; that the railroads' salvation lies in restoring density, not in thinning traffic further; and that the place of sand and gravel near the bottom of the list of ICC's "undesirables for freight traffic" is completely unwarranted.

Although copies of "More Short Haul Traffic" were sent to all interested ICC officials by the NSGA, by fortuitous timing, I was the first one to show these figures to Samuel Towne, head of the ICC Cost Finding Section. Mr. Towne agreed that the ICC figure showing that sand and gravel returned only 55 percent of the fully distributed cost of transporting it was rather harsh, and that 87 percent—based on out-of-pocket costs—is more realistic. (Jensen thinks it should be 110 percent.)

"Our figures," pointed out Mr. Towne, "show broad relationships among various commodities. Certain commodities have historically carried most of the burden of freight rates. The percent of sand and gravel carried by the railroads hasn't gone

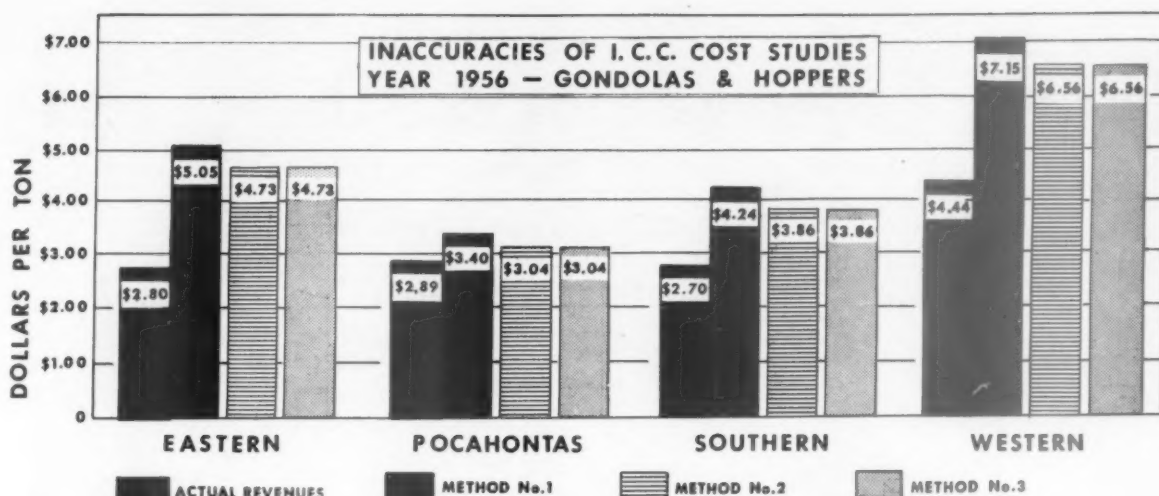
down just because freight rates went up. Many other reasons have contributed. There are all sorts of situations, commodities, and types of hauls where the railroads simply can't compete economically with other forms of transportation."

Mr. Towne asked for time to study the figures in relation to the discrepancies with the conclusions of his Cost Finding Section. ROCK PRODUCTS asked Mr. Towne and the ICC Commissioners to comment on Mr. Jensen's figures; so, too, did the National Sand and Gravel Association and, of course, Mr. Jensen, himself. The ICC chose to handle all three in one package sent to Mr. Ahearn. In an eight-page, single-spaced document signed by C. W. Emken, Director of the Bureau of Accounts, Cost Finding and Valuation, the ICC took detailed and minute exception to many of Mr. Jensen's figures. The specific areas of disagreement were too detailed and too technical to list here. However, Mr. Jensen is now preparing a document answering Mr. Emken's objections point-by-point, and this will be printed and distributed by the NSGA as soon as it is completed.

Mr. Jensen is not disturbed by the counter charges; he considers many of them picayune.

"I'll accept only one minor correction the ICC brought out in its reply," says Mr. Jensen. "But even if we accepted Mr. Emken's corrections right down the line and re-computed the entire rate structure on the basis of his answer to my analysis, the ICC would still be giving me 5 cents a ton at 100 miles under their previous computations. This isn't just a minor difference of opinion. There's such a tremendous divergence between





*These actual revenues are from the 1956 ICC "Transport Statistics in the United States," Table 162, line 614*

*These amounts figured by various methods are what I.C.C. says are fully distributed costs of moving a ton of material in a car of average weight, transported the average distance in each district*

their figures and ours that we could be way off and still have a strong case. But we aren't way off—and the sooner the railroads recognize this, the better off both of us will be."

There are, of course, many degrees of dependence on railroads among rock products producers. Some don't use it at all; some can choose between trucking and rail; and some must depend entirely on rail. Few new plants permit themselves to be boxed-in by depending on rail transportation; yet realistic rail rates act to the advantage of all rock products producers by keeping transportation as competitive as possible.

Samuel Towne of the ICC told me the maximum rates permitted by the ICC don't really mean too much because individual carriers can negotiate rates with individual customers below these maximums. This is borne out by figures compiled by Mr. Jensen showing that actual ton-mile freight revenues haven't risen at all in proportion with freight rate increases over the past decade. Negotiating rates is usually the prerogative only of the producer who has more than one means of transportation available to him. Often the producer depending entirely on the railroads must take-or-leave the rate they offer him.

Yet, this is a tremendous oversimplification of the problem and an easy out for the ICC rate makers. "They make it sound terribly simple," says Ellis Jensen. "They should try to negotiate a rate sometime. Whenever we do, it has to be cleared by all the other railroads and in Washington, and by the time that happens—even if they go along with our request—it's usually too late to

get the business we were seeking anyway. It makes a good story, but in practice it just doesn't work out very well."

To illustrate his point, Mr. Jensen told me about a particular job on which he was bidding which would have made it possible for a railroad to move 571,000 tons of material in train loads over a line then carrying three freight trains and one passenger train a day. The equipment was available, sitting in the yards. The railroad's own cost accountant came in and found the cost of the job to the railroad to be about 20 percent below the rate Jensen had to have in order to get the job. Jensen was elated, thinking a 20 percent profit to the railroad would insure him the rate. Not so. The rail officials told him rates weren't determined that way, and quoted him a ridiculous figure that made it impossible for him to bid the job. As a result, both Jensen's company and the railroad lost profitable business.

Now, in the light of all the arguments pro and con, several things emerge very clearly of life-and-death importance to many sand, gravel, and crushed stone producers.

**The negative factors measure up like this:**

—There are many indications that the ICC will be slow to change its position on this matter. To do so would be to admit that their system of calculating and their interpretations of these figures were both in error. This is a lot to expect from any human being—and particularly from a government agency which is constantly thrust in the

*Please turn to page 125*

# Hard shell aggregate invades Chicago area

Expanded shale finds ready acceptance in Kemper  
and Harris Trust buildings, Calumet River bridge

By ELWOOD MESCHTER

**S**YNTHETIC AGGREGATES—tough, hard pellets almost indistinguishable from natural sand and gravel—are in production in a big two-kiln processing plant near Ottawa, Illinois. There is one big difference between the synthetic and natural aggregates: they weigh only half as much.

The brown, glossy aggregates produced in the new plant of Chicago's huge Material Service Corporation are fired from local shales. Three sizes of finished product are made,  $\frac{3}{4}$  x  $\frac{3}{8}$  in.,  $\frac{3}{8}$  x  $\frac{3}{16}$  in. and  $\frac{3}{16}$  x 0. Whatever the size, from the coarsest to the very finest, each particle has a smooth glassy "skin" that does not readily adsorb moisture. Lightness is achieved by a microscopic cellular internal structure, yet each pellet has the toughness of coral.

The new plant has only been operating since the first of the year, but it is the result of three years' laboratory research and product analysis. The location on the bank of the Illinois River, one of the nation's great waterways, makes it feasible to ship the new aggregate throughout Iowa, Illinois, Indiana, Michigan and Wisconsin.

Now named Materialite, the material found ready acceptance, first in the new roof slab and fireproofing in the Kemper Building, Chicago, then in the deck of a new Calumet River bridge. It also will be in the concrete specified for the new Harris Trust and Savings Bank Building in Chicago. When used as aggregate in concrete construction or in concrete products, the finished products weigh about 95 lb. per cu. ft., compared with about 150 lb. for those made with natural aggregates. There is said to be no reduction in structural strength. Negligible adsorption of water by the aggregate permits a minimum of water to be used in the mix.

The shales to make these lightweight aggregates are found in a 55-ft. seam in the low bluffs on the north side of the river. Here Material Service owns a tract which will supply the plant

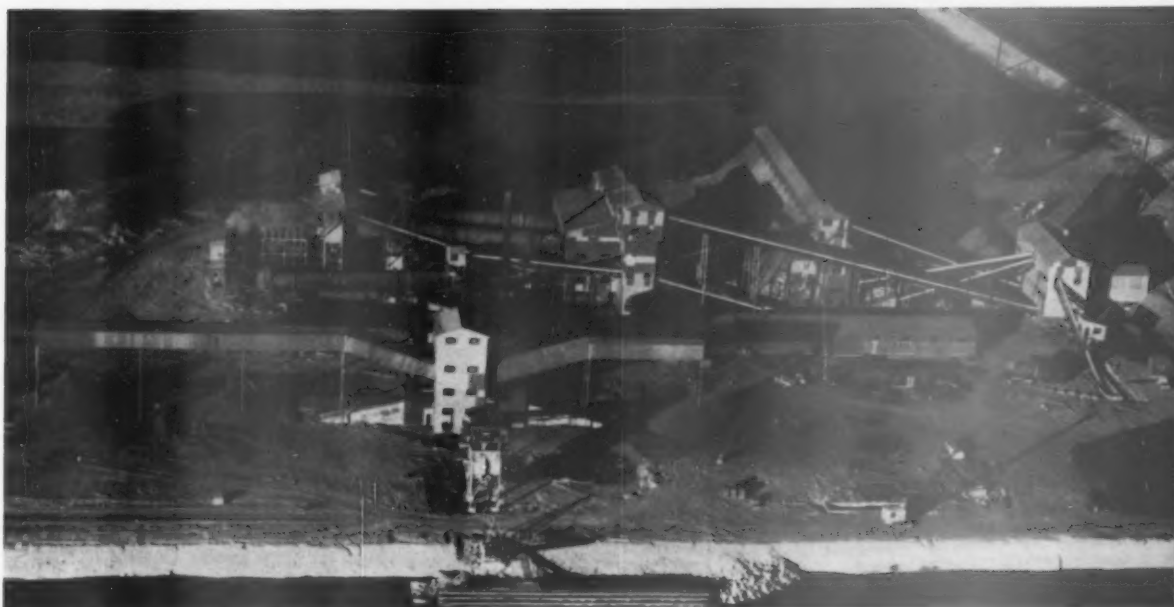
for over a hundred years, making 1,000 tons a day of finished material. The top of the deposit is about 150 ft. above the river, and is now only a mile away. The material in the deposit is made up of dark-gray wafer-thin laminated shale of uniform density, color and chemical composition. It has consistent moisture—between six and eight percent—during all seasons of the year.

The top of the shale deposit is exposed by a walking dragline with a 6-cu. yd. bucket which strips off overburden for drilling and blasting. Loosened shale is loaded out into one of three 22-ton, end-dump trucks for the down-hill haul on the company's wide new road to the plant. One-shift operation of the quarry can keep the plant operating around the clock.

**Classifying.** Two sizes of raw material,  $\frac{3}{4}$  x  $\frac{3}{8}$  in., and  $\frac{3}{8}$  in. x 0, are processed in the kilns, simplifying crushing and screening. Raw material is fed from the truck dump hopper to a 36 x 72-in., single-roll shale crusher with an inclined apron feeder. Crushed shale is carried to the top of a pair of three-deck 6 x 16-ft. vibrating screens which scalp off oversize and drop it to a 60-in. inclined belt conveyor to be carried to a traveling breaker plate secondary crusher. Material from this hammermill is dropped down on the same belt conveyor which takes raw shale from the primary crusher to the scalping screens. Only two decks of the screens are in use. The other deck is available to make other sizes of raw material if they are ever needed in the process.

All raw crushed shale is taken directly to one of four 400-ton storage bins in the kiln firing building without further processing. When these bins are full, raw material is stored in a long, tent-shaped steel frame building. This is used only as standby storage to supplement the kiln storage bins by holding a reserve of material for long weekends or emergencies.

A surge hopper under the scalping screens can



**View from above Illinois River** shows buildings, right to left, for crushing, raw storage, kiln firing (and raw surge storage) and kilns. Materialite is stored in foreground



**Six-yard dragline** loads rear dump units in quarry about a mile from the plant



**Materialite** is loaded into barges on Illinois River, a top route to midwest markets



Large clinker is taken from cooler and wasted



Peak of the raw storage building holds conveyors with traveling belt trippers



Reclaim conveyor is in tunnel beneath Materialite storage pile

## Hard shell aggregate

*continued . . .*

direct the material to an inclined belt conveyor, a long unit which reaches from the crusher building all the way to storage bins in the kiln building. All or part of the material can be diverted to another inclined belt conveyor to take the shale to the storage building. This conveyor discharges to a horizontal belt conveyor in the peak of the storage building and the material is distributed with a traveling belt tripper. The storage building is equipped with a reclaim belt conveyor system to send raw material back to the crusher building, returning it to the same long inclined belt conveyor which now takes it directly from the screen hopper to kiln storage.

Firing coal is brought to the kiln firing building in much the same way as shale. Barges bring coal from tipples only a few miles south along the Illinois River, and these 500-ton barges are unloaded with a clamshell to a storage pile. Coal is reclaimed from storage with a belt conveyor in a tunnel and carried to the top of a 4 x 8-ft. vibrating screen. Here, plus 1-in. coal is scalped off and dropped to a crusher and recycled to the top of the screen. Through-screen coal is sent to the top of the kiln firing building where it is distributed to one of two 400-ton storage bins in line with the shale bins. The coal conveyor is a long inclined belt conveyor parallel to the shale conveyor. A third conveyor in the same group is available as a standby for either coal or shale.





Huge raw storage building holds material sized during peak hours, for use later

Each coal-fired kiln is  $11\frac{1}{4}$  x 160-ft., mounted on two sets of trunnion rollers and turns about  $1\frac{1}{2}$  rpm. However, kiln speed can be changed from 30 to 120 rph. A bank of recording and controlling instruments helps the burner maintain constant control of the quality of the finished product at any production rate, with a constant firing temperature of about 2,000 deg. F. Coal is fired to each kiln through a bowl mill.

**Burning.** Carefully controlled amounts of raw shale are fed into the kilns. It is metered out of the storage bins in predetermined rates ranging from a trickle to the maximum capacity of the kilns. A belt conveyor traveling the length of the kiln discharges to a kiln feeder. As the shale in the kiln travels toward the firing and discharge end it pelletizes and expands; at the same time each pellet acquires a tough "skin" of fused silicates around the cellular core.

Each kiln discharges the incandescent-hot material to a rotary cooler measuring about 10 x 100 ft. Water sprayed on the shell of the coolers helps to reduce the temperature of the pellets rapidly, but they are discharged, still hot, to a hot-fines belt conveyor for the trip to storage. The discharge end of each cooler is fitted with huge drop gates which prevent the entry of unwanted secondary air, for ideally, no outside air would be necessary in the cooler. Eventually, part of the exhaust gases from the kilns may be recirculated through the discharge end of the coolers.

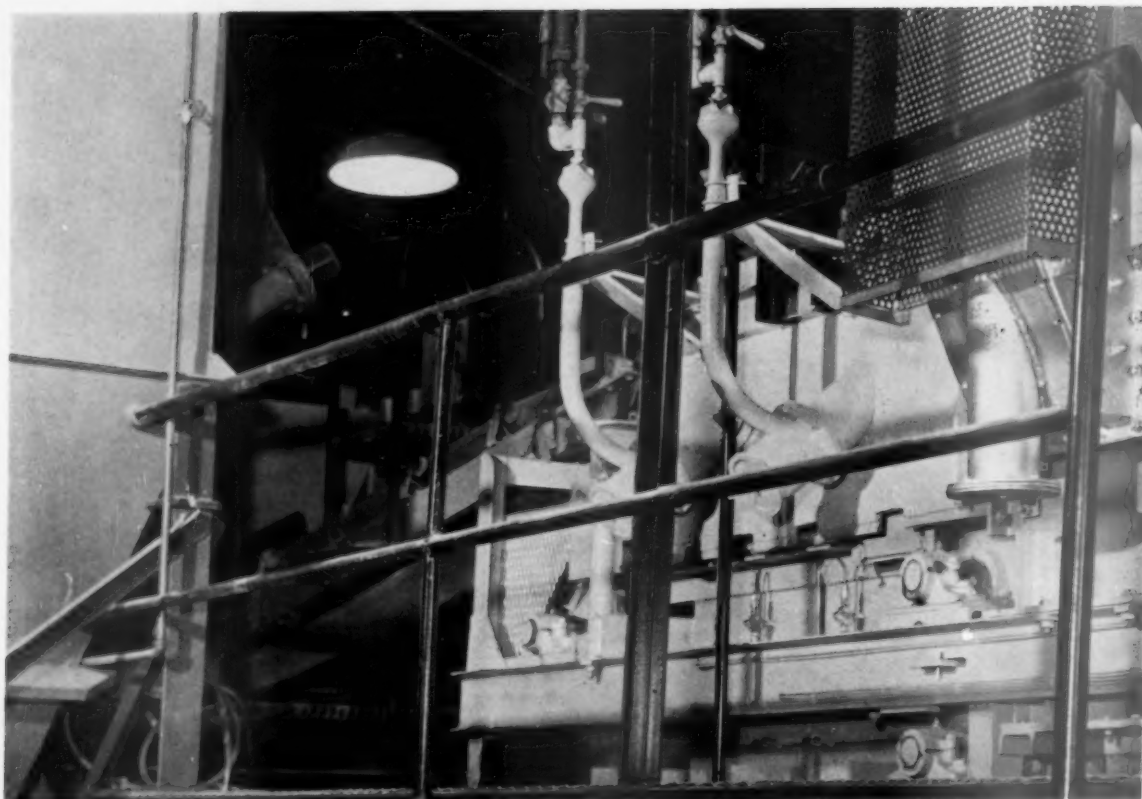
The exhaust gases of each kiln pass through two banks of cyclone dust collectors before discharge to the atmosphere. Dust is removed from collector hoppers by screw conveyors and returned to the boot of a bucket elevator which dumps it into raw material entering the kiln. Finished material from the cooler includes enough fines without the addition of the fine dust. Production experiments showed that these dust collector fines could be introduced into the kilns with the shale, providing a practical way to dispose of dust and to conserve raw shale.

Still hot, the aggregates are conveyed to a pair of three-deck 6 x 14-ft. vibrating screens where they are separated into the three marketable fractions. Each size is taken to storage over enclosed belt conveyors and dropped into stockpiles through dust chutes. The stockpiles are over concrete tunnels with reclaim belt conveyors, and these con-

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#### MAJOR EQUIPMENT USED IN THE MATERIALITE PLANT

Dragline, 6-cu. yd. diesel	Marion Power Shovel Co.
Clamshell crane	Euclid Div., GMC
Trucks, end dump (3)	Rogers Iron Works Co.
Shale feeder, 5 x 24 ft.	McLanahan & Stone Corp.
Primary crusher, 36 x 72 in.	Hammermills, Inc.
Secondary crusher, hammermill	Materials Service Corp. design
Belt feeder, 5 x 32 ft.	Barber-Greene Co.
Belt conveyors	Shaeffer Poidometer Co.
Shale feeders (4)	Raymond Div., Combustion Engr.
Coal mills (2)	Allis-Chalmers Mfg. Co.
Vibrating screens	Allis-Chalmers Mfg. Co. (1)
Kilns, $11\frac{1}{4}$ x 160 ft. (2)	Hardinge Co., Inc. (1)
Rotary coolers, 10 x 100 ft. (2)	Buell Engineering Co., Inc.
Dust collectors (4)	Buffalo Forge Co.
Exhaust fans (2)	Nordberg Mfg. Co.
Cone crusher	



The traveling grate at the Allis-Chalmers pilot plant. Raw pellets enter at the left, are dried in the first chamber of the grate and are partially hardened in the preheat chamber being in-

## How I look at the

**T**HE ACL PROCESS—new in this country and radically different from conventional cement making systems—offers the industry an opportunity to achieve high operating efficiency with low initial investment. With good fuel economy and low dust losses, the process can be installed near residential areas or areas remote from sources of fuel.

A basic requirement of the process is the need for raw materials which will make good pellets, the essential ingredient of the system. Pelletizing of exact amounts of limestone and shale is an art which requires trial and error research to establish, and high caliber operating men to maintain under varying operating conditions.

The system depends upon the maximum performance of pelletizing equipment, traveling grates, feeders and auxiliary equipment not common to cement plants. Great care must be main-

tained in the selection of this equipment to assure its reliable and continuous performance; and its ease of maintenance.

Once the pelletizing process is established, the process is far less sensitive to changes in raw material fineness, composition and temperature than the same conditions which cause flushing or surging in the conventional dry or wet processes.

The pellets are processed and fired into cement clinker under instrumented, closely controlled conditions, and the feed rate of the green pellets is far more accurate than that of the raw materials in the wet or dry processes. As a result, clinker quality is more uniform and consistent than in these other methods.

The ACL system (so named from the initials of Allis-Chalmers, the manufacturer, and Dr. O. G. Lellep, the inventor) consists essentially of a traveling grate and a rotary kiln in series. A continuous bed of pelletized moist feed is put on the

\*This article by Mr. Hauser of the W. R. Bendy consulting engineering firm is based entirely upon his own actual operating experience with the ACL process.



spected by the operator. Product from the grate is discharged into the rotary kiln directly below the operator where final burning is completed

## ACL system

By KARL HAUSER\*

grate, where it is dried, preheated, and discharged into the kiln for calcining and burning. The ACL grate consists of a slow-moving conveyor made of chain and grate castings, similar to a stoker grate. Its firebrick enclosure is divided by baffles into two chambers. The first dries the water from the fresh pellets. In the second (preheating) chamber, the pellets are heat hardened, probably acquiring a ceramic bond of the argillaceous materials, shale or clay, in the raw feed.

In the first chamber, the pellets are dried by a downflow of 600 deg. F. gases taken from the preheating chamber by an intermediate fan. After this second pass through the pellet bed, the gases, scrubbed of dust and laden with moisture, are discharged from the system at about 250 deg. F. by the main exhaust fan.

From the drying section, the pellets move into the preheating chamber, where the 1,800 deg. F. gases, just out of the kiln make their first pass through the bed, losing dust and dropping in temperature to 600 deg. F. The final pellet calcining and burning takes place in the rotary kiln in the conventional manner, except for the lower fuel requirements. Due to the high fuel efficiency of the system, it uses about 600,000 Btu. per barrel.

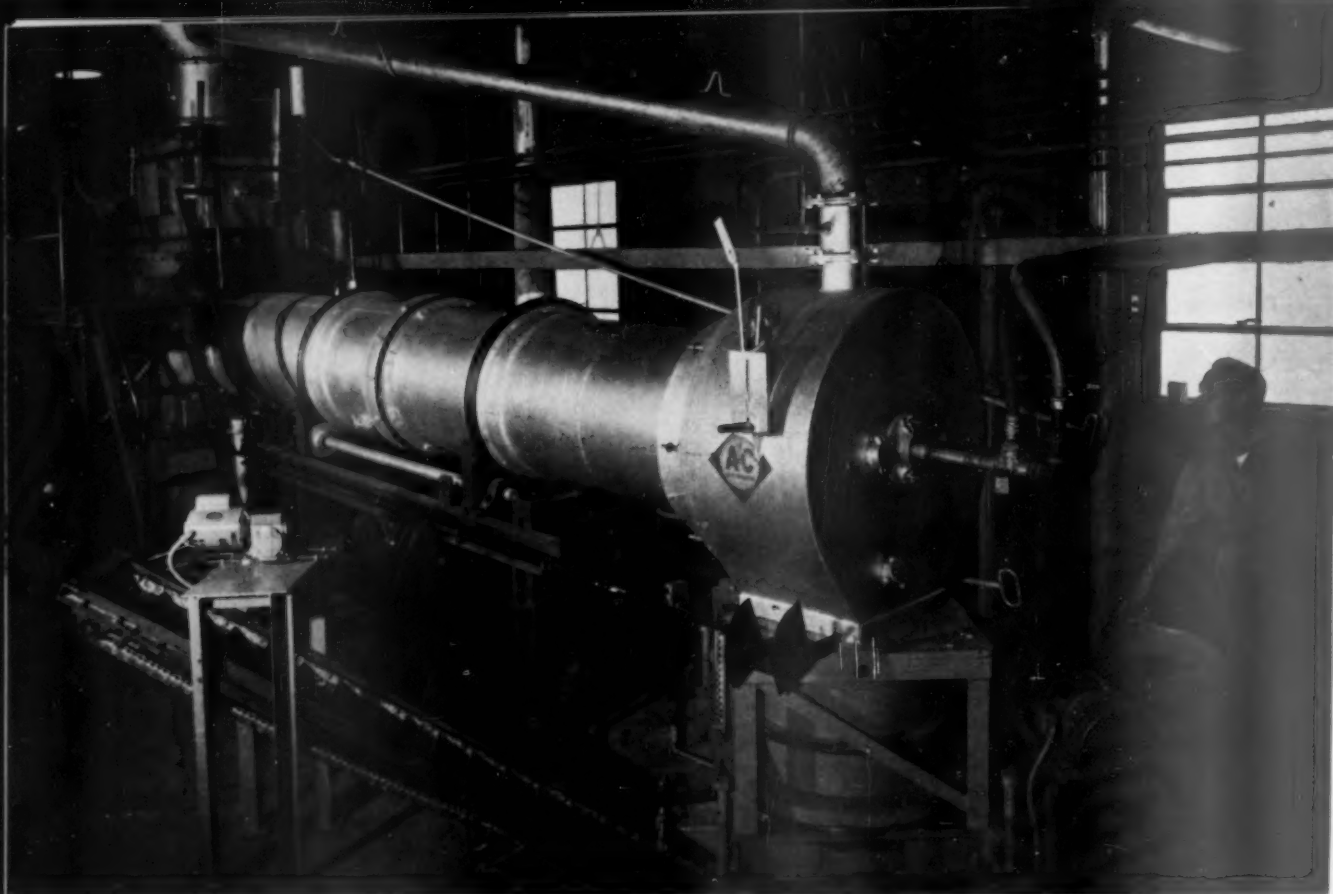
To prepare raw materials for the ACL system, either drum or pan pelletizer may be used. The pan type is preferable due to pellet uniformity and ease of control. Modern pan pelletizers range from 10 to 15 ft. diam., 2 to 3 ft. deep, and have an adjustable slope, extremes being about 50 and 65 deg. from the horizontal. Their variable speed range will be between 6 and 16 rpm. The moisture content of the finished pellet will be probably in the 11 to 14 percent range, depending largely on raw materials, but also on pan depth, speed and slope.

Some basic requirements for good raw material pelletization are constant feed characteristics, controllable feed and water systems which will remain constant on a set position and effective cleaning of the back and side of the pan. Other factors may be critical: the points of introduction of feed and water, the degree of fineness of the water spray and the degree of aeration of feed to the pan.

Assuming that the basic requirements have been met, the four principal control criteria are feed rate, pan speed, pan depth and pan slope. A change in any of these will change the retention time of the pellet in the pan. An increase in feed rate will decrease retention time; an increase in pan depth, decrease in pan slope, or an increase in pan speed will increase retention time.

An increase in retention time causes larger, denser and higher "green-strength" pellets; a decrease in retention time acts conversely and may contribute to the discharge of some dry feed. Therefore, the factors which tend to increase retention are brought into effect as feed rate is raised, and two changes counteract each other. In short, a feed rate increase will produce smaller, less dense pellets, so the slope will be decreased, pan depth increased or speed increased to increase pellet size and density again.

To some extent the stronger the pellet the better its chance for survival through the system; but "green strengths" do not correlate perfectly with the crushing and abrasion resistance of the pellet which has been preheated on the grate. These depend more on the nature of the raw material and must be determined by trial.



Overall view of the pilot plant. Traveling grate is shown at left; kiln in the foreground

## The ACL system

*continued . . .*

Strength and density of the pellet differ in their effect on the pellet performance in the system. Pellet density may be critical due to its effect on moisture release in the drying chamber. If the bulk density is too high, over 80 lb. per cu. ft., for example, the pellets may be sensitive to temperatures which are normal for the drying system. A lack of porosity for escape of steam from the interior of the pellet will result in peeling or explosive disintegration in the drying chamber.

Pellet bulk density as much as 10 lb. per cu. ft. greater than the normal 75 lb. per cu. ft. may not dry at all in the first zone. Then they will explode completely in the extreme heat of the second chamber.

A number of other points should be considered in designing pelletizing systems for the ACL process. The feed system should be in duplicate to avoid kiln down time. Variable speed weighing feeders to withdraw from feed bins appear to be advisable. The feed and water should be synchronized mechanically or electrically, with ratio adjustment so that a change in feed rate to the pan

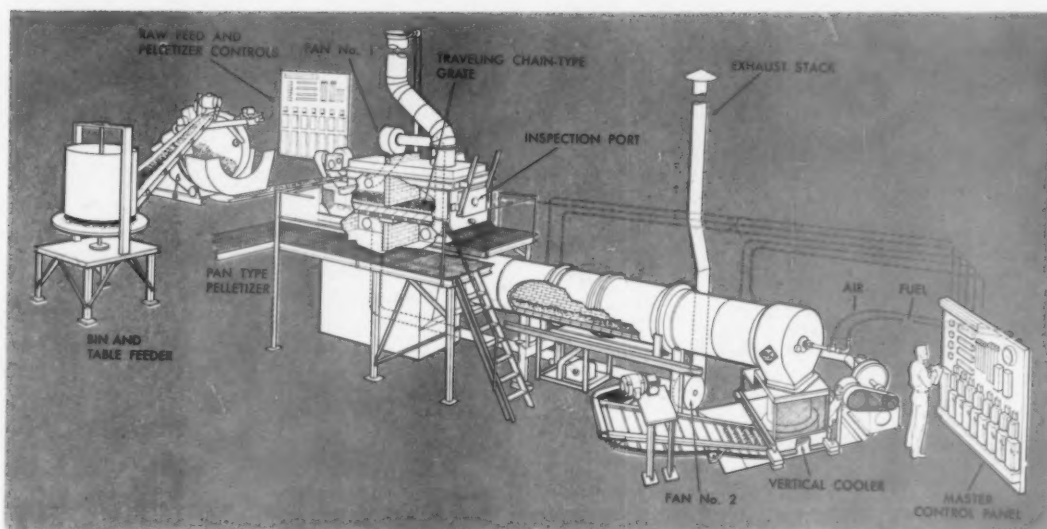
does not require juggling of water rate to find the right point. The feed should be conveyed into the pan steadily, with as little drop, splash or aeration as possible. Collected dust should not be introduced until production is leveled out, then its effect should be studied. Collected dust should go into the blending system, rather than directly into pelletizing pans.

**The grate and drive are almost trouble-free**, except for an infrequent broken grate which takes only 5 min. to replace.

Grate speed is normally synchronized with the kiln to give uniform kiln bedding. Grate-bed depth is adjustable, varying from 4 to 9 in. Once the correct depth has been found, it will normally remain unchanged.

**The kiln is almost conventional in design**, having normal diameter for its production rate, but it is much shorter than its wet or dry process equivalent. The principal difference is in the very tight, air-cooled seal at each end, necessary to achieve





Sectional view of the pilot plant showing how the entire ACL system works

the designed fuel efficiency and productive capacity. Because the capacity depends on the ability to pass gases through the pellet bed, lower fuel consumption and lower volume of exhaust gases permit higher production. There is reason to believe that refractory life will be longer than usual, due to the low firing rate required.

Experience indicates that oil, gas or bin-fired coal systems are preferable. The system should have as little primary air as possible, and the maximum amount of high heat secondary air. Any heat removed from the system for coal drying should be taken off the clinker cooler if possible. In firing such a short kiln it is important to get mixing of fuel with secondary air and attain ignition temperature quickly. This may have to be done with special hood design, but in some European practice, coal is fired at the extra high tip velocity of 15,000 fpm. for greater turbulence and faster ignition.

Since dust loss from the system is small, the ACL system clinker analysis will more nearly approach the kiln feed analysis than other systems. There is also less contamination by coal ash and sulfur.

However, the double-pass system traps volatilized alkali compounds in the incoming pellets until the concentration of alkali builds up to the point that the amount entering balances with that leaving in clinker and exit gases. The alkali in the clinker will be higher than in a wet or dry process kiln, since so little can leave in the low temperature stack gases.

It is not possible to know in advance what alkali concentrations will be reached in the materials in process. But if the alkali in the raw materials is

high, the amount in the process gases may be enough to penetrate refractories, causing them to expand, warp and weaken. This effect may be found in the back end of a rotary kiln with high alkali concentration in a form which looks like "pinch spalling" or "cobble-stoning" of the kiln brick. It may be that the same thing has been happening for years, particularly in wet process, unrecognized for what it actually was.

The refractories in the grate housing may also give difficulty unless proper allowance is made for the effect of the chemicals in the preheating chamber which are characteristic of the kiln exhaust gases.

One major firebrick manufacturer (A. P. Green) is now engaged in extensive testing and research on the alkali effect in refractories, with promising results toward prevention with the right refractory. A designer of refractory enclosures (M. H. Detrick) has attacked the difficulty by specifying frequent joints to allow for more expansion, thicker sections for strength and shorter lengths of exposed surface to avoid warping.

An ACL system is not complex from a control standpoint. In addition to standard rear and hood drafts, and rear temperature, there are draft and temperature readings in the other three grate chambers—under the pre-heating section, over and under the drying section. Two fans are used for balancing grate draft conditions, and one of these can be fully controlled automatically. One kiln operator and one pelletizer operator are required to run the system, possibly with one helper between them.

In planning this system primary consideration

*Please turn to page 136*

*At new dam site . . .*

## Bucket drill pinpoints aggregates in deposit



The reinforced bucket drill often dug one hole in a shift. Average depth is 35 ft.

**Data on 10,000,000 tons of aggregates for  
Glen Canyon dam were found faster and  
at one-fifth the cost of hand labor**

*By J. M. WELLS\**

**W**HEN THE BIG DRAGLINES start digging for aggregates for Colorado River's huge new Glen Canyon Dam, they will follow a pinpointed guide, thanks to one of the most precise exploratory programs ever conducted. About 10,000,000 tons of material are needed for the concrete structure, and their exact whereabouts are now known. Directing those draglines to paydirt is a double-barrelled operation in which Merritt-Chapman & Scott Corp. enlarged upon preliminary information supplied by the U. S. Bureau of Reclamation.

The Bureau had determined that suitable dam-building aggregates lay about 4½ miles distant from the dam near Kanab, Utah, in Wahweap Creek, a tributary of the Colorado. It also had put down some rotary drill holes, and had dug inspection pits by dragline. But a high-water table limited the depth of the work to a great extent and the information, though extremely valuable, needed enlargement.

This was where Merritt-Chapman & Scott went to work. A detailed sampling program has been conducted by modern heavy-duty, bucket-type drilling equipment sinking large-diameter holes. This type of earth boring device permits careful screening and analysis of the actual physical content of material. Forty holes have been drilled in the sampling program; their location was deter-

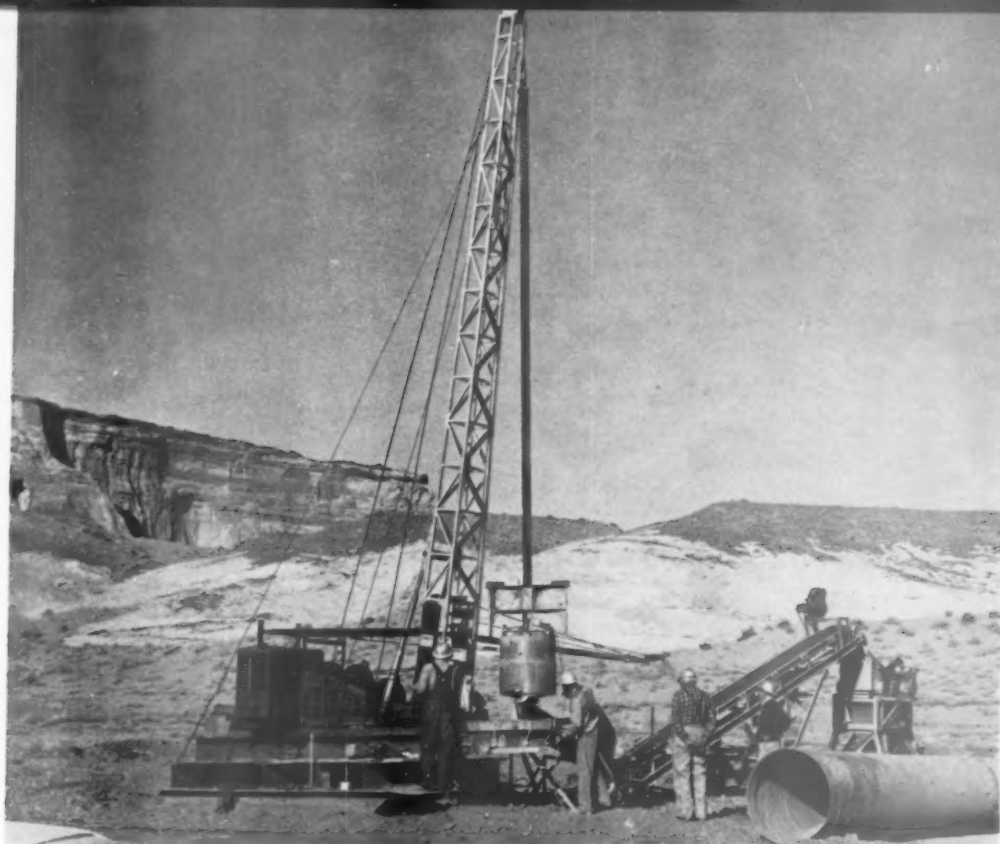
mined by an extensive aerial photo-mapping effort and a seismic profile. The former, made by Fairchild Aerial Surveys, Inc., tied the aggregate deposit down to known points; the latter, run by a geophysical crew of Turner & Associates, Phoenix, Ariz., located bedrock exactly. All correlated data is being completed in the form of an aggregate sizing-depth chart, superimposed on the aerial map.

Wahweap Creek is a normally dry wash, but subject to flash floods. The creek cuts down through a mountainous watershed to drop off dizzily into the 800-ft. deep Colorado River canyon above the damsite. The gravel deposit, up to 45 ft. deep, averages 750 ft. wide for a distance of 4 miles. When the dam is finished, the aggregate deposit site will form part of the Glen Canyon Reservoir, with the dug-over area inundated.

In countless ages past, Wahweap Creek's bed built up with a thick deposit of alluvium, whose particles consist of some deleterious tuffs and sandstones, good sandstone, quartzite, andesite, and some of the limestones and hard basic rocks typical of the upper Grand Canyon.

**Rig used in the drilling assignment.** Measured by any standards, the 40-hole exploration drilling assignment was one of the toughest ever undertaken by rotary bucket-type drilling equipment.

\*Concrete & Materials Engineer, Merritt-Chapman & Scott Corp.



**Bucket drill rig, skids supporting it, and conveyor to three-deck screen are shown at work at Wahweap Creek. Records of size distribution of sand and gravel throughout the deposit tell the contractor which sizes are short**

In settling on what machine to buy for this job, an exhaustive search of the current market was made, looking for a rotary rig which would give a high percentage of productive working time in a sand-gravel formation which frequently contained cobbles up to 10 in. diam.

The result was the purchase of a Calweld 150-A earth boring machine equipped with regular and rock-digging buckets. Because the aggregate production site was soft and sandy in many spots, truck mounting of the machine was not desirable. The drill instead was mounted on a heavy steel H-beam skid frame, which could be towed easily by a tractor-dozzer which also built access trails for the unit. The skid mounting was shop-built at Glen Canyon Dam.

The drill handled the tough assignment with little beefing up or trouble. Buckets were strengthened on the inside to handle cobbles instead of the clay and dirt they customarily dig; a set screw arrangement in the ring gear was reversed to give better action and extra angle-iron braces were welded to the derrick to give added stiffening under multiple-part line handling when heavy casing sections were handled.

A unique casing driving head and ram also was devised, consisting of a 4 x 6-in. steel ram and a



**The percent of each of the four aggregate size groups is weighed, recorded for each foot down the hole**



Drill foreman V. O. Stone and author J. M. Wells, materials engineer for contractor, stand beside bucket drill, whose rotating teeth scoop gravel

## Aggregates sampling

*continued . . .*

steel driving head. This acts on a steel driving head, which fits over the casing. The ram and driving head, picked up as one piece on the second drum of the drill hoist, was handled without disturbing the load line which carries the kelly bar and rotary bucket from the other drum.

The 40 exploration holes averaged 35 ft. in depth, with a 45-ft. maximum. They were spaced on a 400-ft. grid. The 400-ft. spacing covered the area adequately, but still permitted detailed sampling. Excavation of the holes was made by a 30-in. diam. bucket, over-excavating slightly to permit the installation of a 36-in. casing.

Since the drilling machine has a 44-ft. telescoping kelly, all holes were drilled without adding extra steel to the driving shaft. The method proved much superior to shallower dragline-excavated pits, and it represented only 20 percent of the cost of doing the work by hand labor. Actually, hand labor was completely impractical, because the water table lay only a few feet below ground surface. The job of unwatering would have been staggering with hand labor methods. Even on the deepest holes, the crew often completed a unit in a shift, and moved the machine on to the next location.

While speed was important (the whole sampling job took only from September 1 to December 15 despite a shutdown of several weeks due to heavy October rains and floods), it actually was secondary to the problem of getting a precise analysis. Precision results were developed beyond question.

As the rotary bucket of the drill dug material, the elevation of that bucketload was carefully plotted and recorded. When the bucket was filled, the contents were hoisted to the surface and dumped to a small feeder, which trained the material down to a 35-ft., 18-in. conveyor. This conveyor then fed the material to a power driven triple-deck set of vibrating screens.

**Analyzing procedure.** The screens in this plant automatically separate each bucketload of gravel into the following sizes: 6 x 3 in.; 3 x 1½ in.; 1½ x ¾ in.; and ¾ x 0 in. Chutes from the vibrating screens train the material down to wheelbarrows, which are carefully weighed on beam scales to record the actual percentage of each size material per foot of testhole depth. Following this step, the ¾-in. minus product is analyzed separately. The result, plotted on the aggregate map, represents one of the most comprehensive aggregate studies ever made on a contracting job. It will be well justified, since aggregate plants of this size represent enormous investment.

All sample drilling was done with the help of steel casing pipe, carried down full depth as excavation progressed. When occasional big cobbles or boulders were found, they were picked up by a rock bucket, interchanged quickly with the regular bucket on the driving kelly bar. The buckets also were hardfaced with welding rod to combat abrasion.

*Please turn to page 142*





At the start of the fiber lifting operation, the suction hoods, right, separate asbestos fiber from rock as both pass down the gyrating screens

## *In asbestos mill—*

# Air gently separates fiber from rock

Result: minimum breakdown of fibers, better dust collection

**T**HE PRINCIPAL PROBLEMS in the milling of asbestos ore are the efficient separation of the asbestos fiber from the host rock with minimum breakdown of fiber, and collection and disposal of dust.

At the Asbestos Corporation's Normandie mine near Black Lake, Quebec, a new approach to these problems has been attempted with the installation of six Aerofall mills in the early stages of the milling process together with six huge air foil centrifugal fans which provide the air to sweep the mills.

Several other useful tasks are performed by these same fans, powered by 300-hp. motors. They suck the airborne fiber through vacuum hoods over batteries of gyrating screens, carry the fiber up to the collectors, exhaust the dust into filter bags in the plenum chambers for separation, and finally, they can help keep the mill's 210 employees warm in the winter. After passing through the filter bags, the air can be discharged through louvers to help warm the building.

The six powerful units can move a total of 900,000 cfm. of air. They embody a new concept in design, utilizing a nonoverloading centrifugal wheel made with hollow-section aerodynamic-shaped airfoil blades instead of standard backward-curve flat blades. An advantage of the aerodynamic design is a slower fan rotation with greater airmoving capacity. This means more air moved with less horsepower and lower noise levels.

Asbestos production at the Normandie mill starts when the ore is hauled by diesel trucks from the open pit mine to the primary crushers. From these it goes to secondary crushers for further reduction.

Conveyor belts carry the crushed rock and asbestos in a steady stream to the dryers which extract all the moisture, and the dry crushed ore is then stored to await further processing.

From the dry ore bin the ore is conveyed to the

*Please turn to page 140*



## Stone plant meets twin needs

By RAY DAY

**... handles both highway  
and industrial requirements**



**T**WO THINGS WERE UPPERMOST in the mind of W. D. Jeffrey, Arkansas contractor, when he set about building his aggregates plant: flexibility to meet changing market conditions in a long-range operation, and efficient methods of processing all the materials available. His recently opened \$1-million Jeffrey Stone Co. near North Little Rock, as one of the most efficient and totally flexible aggregates producing setups in Arkansas, bears witness to his experienced planning.

Mr. Jeffrey built his plant astride a ridge overlooking U. S. Highway 65. In the 400-acre deposit, there is an estimated 25-year supply of quartzitic sandstone ranging from 50 to 150 ft. deep. The stone has exceptional qualities of hardness,

**Gravity aids material flow** in plant set on slope. This is primary end of process, ending with two belts to surge piles



Wide-angle view of plant centers on surge piles of concrete and base rock

weight, and abrasive resistance. From this plant will pour a vast amount of aggregates needed for the booming construction period ahead: industrial expansion and the highway program provide the twin market lures.

"I look for continued expansion and activity in the construction industry in this area for several years," said Mr. Jeffrey. "And the approximate year's delay in the national highway program will have its effect in lengthening out the total period. At its present rate, it figures that as long as twenty years will be required to complete it instead of the thirteen originally predicted." However rapidly the highway program is accomplished, this plant was engineered to meet its demands.

Two key features are incorporated into the Jeffrey plant—these are its ability to meet various size specifications and an ingenious cross-conveyor system that can upgrade marginal material.

Jeffrey Stone Co. can produce any size concrete aggregate currently specified, dry or washed. This 500 tph. operation can be carried on independently of the primary portion of the plant, so long as a 45,000-ton surge pile lasts.

The plant crushes stone in seven types and in sizes from  $\frac{3}{8}$ -in. to riprap. The main products are concrete aggregate, asphalt aggregate, sealing chips, road stone, filter rock, ballast and riprap.

**Quarry.** The flow of material starts with the drilling and quarrying, since the rock is a solid hard sandstone which requires shooting. Mr. Jeffrey used his mechanical ingenuity to rig a rotary drill and its 600-cfm. compressor on a tractor, with the compressor in line instead of crosswise. He took out the tractor engine so that the gears and transmission could be operated by an air motor. Using 6 $\frac{1}{2}$ -in. diam. tungsten carbide bits, the machine drills about 17 ft. per hour. Holes will be 80 ft. deep when the full quarry face is developed. Two tractors equipped with rock wagons are loaded by a 2 $\frac{1}{2}$ -cu. yd. shovel to transport blasted rock to the feeder.

**Primary processing.** Advantage was taken of the steep hillside to get a gravity flow of material wherever possible. The feeder was designed for handling high material tonnage with heavy abrasive shock loads. As 3-ft. blocks drop off the end of the feeder, they are slowed down by two hanging sets of old tractor tracks. These are suspended by cable from a crossbar frame, mounted above that point. The tracks help prevent excessive impact on the next unit in the system—a 5 x 10-ft. vibrator which removes 4-in. minus material ahead of the jaw crusher. This catches all the shale and small rock, dirt or other fines, stripping clean the



Hoppers hold stone from concrete aggregates section of plant; rail spur will also serve plant

Vibrating screen and cone crusher are first part of concrete stone plant; other screens recycle oversize back to these crushers



## Stone plant meets twin needs

*continued . . .*

hard, sound sandstone which passes on through the main plant system. The rock deposit contains about five percent shale which is removed as fines.

Divergent routes then are taken by the stone. That large material which is retained on the vibrator takes Route 1, destining it for high-grade aggregate.

Route 1: Large stone remaining on the vibrator drops for primary reduction into a 42 x 48-in. over-head eccentric jaw crusher, from which it falls to a 42-in. apron feeder and is carried to the top deck of another vibrator. This vibrator scalps off large size riprap for storage in a surge bin. Fine material, 1 in. minus, can be dropped through the bottom deck into surge bin storage for loading out as sub-base material.

Under normal operating conditions, 1-in. minus crushed fines will be taken out in the surge bin and the balance of rock will be sent by 36-in. elevating conveyor to the 45,000-ton surge pile for use in concrete aggregates.

Route 2: Material in this line consists of the smaller rock dropped through the vibrator ahead of the jaw crusher. To this may be added any portion from Route 1, by means of a reversible cross-conveyor system that connects discharge points of Routes 1 and 2. The material is chuted to a 30-in. elevating conveyor to the top of a 25,000 ton surge pile for supplying base rock.

**Making concrete aggregates.** Tapping the surge pile on Route 1 is a reinforced concrete tunnel with electrically operated gates which feed onto an in-

clined conveyor. This takes rock to the head of the concrete aggregate producing plant. First it passes over a 5 x 10-ft. vibrator, from which larger size particles go through a drop chute into a standard 4½-ft. cone crusher. Finer material from the second deck drops into a 4-ft. short-head crusher which turns out smaller sizes.

Conveyors carry output from these crushers down to two sets of vibrating screens equipped with spray washing apparatus. The screens are arranged in closed circuit, using a return belt conveyor, with the short-head crusher. Thus all material remains in the circulating system until it meets size requirements.

Finished material from the final vibrating  
*Please turn to page 142*

### MAJOR EQUIPMENT USED AT JEFFREY STONE CO.

Conveyors	Barber-Greene Co. Pioneer Engineering Works Iowa Mfg. Co.
Drill	Ingersoll-Rand Co.
Tractors	Caterpillar Tractor Co.
DB (1)	
DW21 (2)	
Rock wagons, PR21 (2)	Athey Products Co.
Hauling units, 10 tons (2)	Euclid Div., GMC Corp.
Feeders	
Apron feeder, 42-in.	Pioneer Engineering Works
Plate feeder	
Vibrating screens	
5 x 10-ft. (2)	
5 x 12-ft. (1)	
4 x 12-ft. (4)	Iowa Mfg. Co.
Jaw crusher, 42 x 48 in.	Pioneer Engineering Works
Vibrating feeder	Syntron Co.
Crushers	
4½-ft. standard cone, Symons	Nordberg Mfg. Co.
4-ft. short-head, Symons	
Bins, 100-ton (2)	Blaw-Knox



A typical application of the KENNEDY Cuber as a portable unit is this aggregate plant operated by the Public Works Department of Jamaica, BWI. This impactor produces four grades of aggregate simultaneously.



## THE KENNEDY CUBER SENIOR PORTABLE OR STATIONARY

With a mobile Cuber your plant can be set up at the most favorable location between the source of raw material and the point of end use. The ease with which this plant can be moved and set up as location requirements change is a result of the portability of the KENNEDY Cuber.

### Other features of the KENNEDY CUBER are...

- **ROTORS**—Welded laminated steel plate rotors turn on heat treated alloy steel shafts, pressed and locked into the rotor cores. Three cast manganese steel hammers are rigidly attached to each rotor by an exclusive method which permits quick, easy adjustment for wear.
- **BEARINGS**—Heavy duty, self-aligning, spherical roller bearings are rigidly attached to withstand the severe punishment of the breaking action with minimum friction and maintenance.

• **BASE**—The sturdy, one piece base is made of arc-welded, heavy steel plate. Portable units are supported by 16 heavy duty tires.

• **HOUSING**—Steel plate housings are protected against wear by cast manganese steel liners and the exclusive KENNEDY rotor end disc. Conveniently located doors provide ready access.

• **REDUCTION CHAMBER**—Maximum impact and minimum attrition are built into the KENNEDY reduction chamber. Coupled with the advanced KENNEDY rotor, this design is responsible for the high degree of cubing for which this KENNEDY Impact Mill is famous.

• **BAFFLES**—The adjustable, wear-resistant steel baffle deflects over-size rock back to the hammer circle for further reduction. Adjustment of this baffle provides regulation of flow and accommodation for differing characteristics of various rock types.

*Send for descriptive literature on the KENNEDY Cuber Senior and Junior. Consult KENNEDY for the most effective approach to your impacting and crushing problems.*



### KENNEDY VAN SAUN MANUFACTURING & ENGINEERING CORPORATION

405 PARK AVENUE, NEW YORK 22, N. Y. • FACTORY: DANVILLE, PA.

PRIMARY AND SECONDARY GYRATORY CRUSHERS • JAW CRUSHERS • ROLL CRUSHERS • IMPACT BREAKERS • HAMMER MILLS

• BALL, ROD & TUBE MILLS • ROTARY KILNS • DRYERS • PREHEATERS AND COOLERS

• PNEUMATIC CONVEYORS • COMPLETE CEMENT & LIME PLANTS.

ROCK PRODUCTS, July, 1958

Enter 1467 on Reader Card



Charging the stone to box-like intermittent kilns

## *Lime around the world, part 2 . . .*

# Research is imperative in Australia

By VICTOR J. AZBE

**A**T THE MOMENT I AM STILL supposed to be in Honolulu, with a 4,000-mile flight from St. Louis behind me and a flight of 5,500 miles to Sydney ahead of me. I had been cautioned to take it easy and to rest on the way, or I would be "a nervous wreck for a week" on my arrival in Australia. But it was impossible to rest, with a voyage of months into the immense void and the many odd corners of the world ahead. The final reports had to be written, the last instructions had to be issued, the ties had to be loosened for the cast-off.

For once, Honolulu exerted no charm; it was the far off lands on the other side of the world that beckoned now. Neither the Royal Hawaiian or "Trader Vic's" appealed to me. I was not a tourist but an engineer on a series of engagements. My thoughts were of problems which I would encounter and whether I would be equal to them. I could not be certain, but I could only hope that they would fall within the scope of my ability.

I knew that there would be problems of kilns, of higher production, thermal efficiency and quality control. There would also be problems of fuels and of stone; of executives, their personnel, their abilities and knowledge of lime, their wishes or whims.

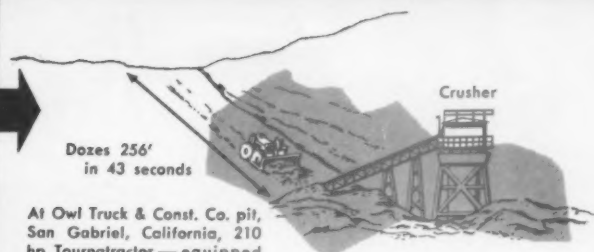
Lime producers of foreign lands stare in disbe-

lief when told that in our country, what is considered good limestone will have from 98 to 99 percent  $\text{CaCO}_3$ , anything less being rapidly degrading as far as chemical lime is concerned; that stone of 95 percent  $\text{CaCO}_3$  is considered hardly suitable for lime, and that a lime producer in this country is seriously handicapped competitively if he does not produce a lime of 95 percent  $\text{CaO}$  availability. They wonder because their own stone may be in the low 90s or even 80s and probably that is all that is readily available.

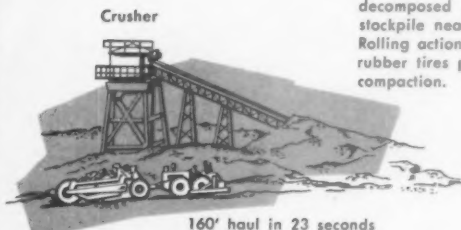
I am not saying that there isn't good limestone in say, Brazil, or in India, but it certainly is not anywhere near Rio or Bombay! Our good limestone deposits are also widely separated but we have transportation facilities which no other country possesses. A rail shipment of lime in Brazil may be on its way for a week—longer if the car gets sidetracked or lost—and what their rainy season can do to this lime can easily be imagined.

Throughout the world, the primary problem is not kilns; it is the stone available. A kiln that is perfectly suitable for good stone may not be at all suitable for poor stone. What is needed is not good stone, but kilns and hydration that will compen-

Please turn to page 96



At Owl Truck & Const. Co. pit, San Gabriel, California, 210 hp Tournatractor — equipped with wings on dozer blade — pushes heaped load to crusher at speeds to 7.5 mph.



Tournatractor scraper spreads decomposed granite rock on stockpile near crushing plant. Rolling action of tractor's big, rubber tires provide excellent compaction.



## How Owl Truck & Construction Co. produces 7,000 tons of granite road-base daily

Owl Truck & Construction Co., Alameda, California, produces 7,000 tons of crushed, decomposed granite rock daily, at their San Gabriel, Calif. pit. Material is used for road-base under concrete or asphalt.

To achieve required production, the company tried two crawler-tractors for short-haul dozing of material to crushers. This method was found to be slow and expensive. Due to loose abrasive rock, crawler's tracks had to be replaced every 1000 hours. Owl Truck then purchased 2 modern Le-Tourneau-Westinghouse rubber-tired Tournatractors® to handle this phase of the job.

Here's how these rubber-tired tractors helped speed production:

### 512' dozing cycle in 1 min. 46 sec.

First, the decomposed granite rock is loosened. Then Tournatractors — traveling in 3rd gear (7.5 mph) —

doze heaped load 256' down 12-15% grade to crusher in 43 seconds. Tractors then back up same distance in high gear (7.2 mph) in 1 minute 3 seconds... completing 512' cycle in 1 min. 46 sec. Fast dozing cycles like this helped boost production.

### Tows scraper on long hauls

To move material long distances, one of the tractors occasionally tows an old L-W Carryall Scraper. With speedy Tournatractor used as prime-mover, scraper self-loads 8 yds. in 37 seconds over 125'. Unit then hauls 160' down 8% grade in 23 seconds... and spreads material on stockpile in 13 sec. (Stockpiled material is dozed to crusher by rubber-tired tractor when needed.) Tractor-scraper returns 334' to load area in 48 sec... completes a 695' cycle every 2 min. 1 sec. The one-man Tournatractor-scraper combination averaged 24 loads or 192 yds. per hour.

### "Low maintenance costs, increased production"

Pleased with Tournatractor's performance, Pit Superintendent Walter C. Butler said, "This tractor definitely has a place in pits and quarries. The low maintenance costs and increased production show up well on the balance sheet." The operators were also enthusiastic about these rubber-tired tractors. Emery F. Dolson, Jr. says, "There's a lot less wear and tear on me when operating Tournatractor instead of a crawler."

### Compare Tournatractor with present dozers

Why not ask for a demonstration? Compare this high-speed, go-anywhere rubber-tired tractor with your present dozers. See how you, too, can increase pit production and cut operating costs. Call or write for full details.

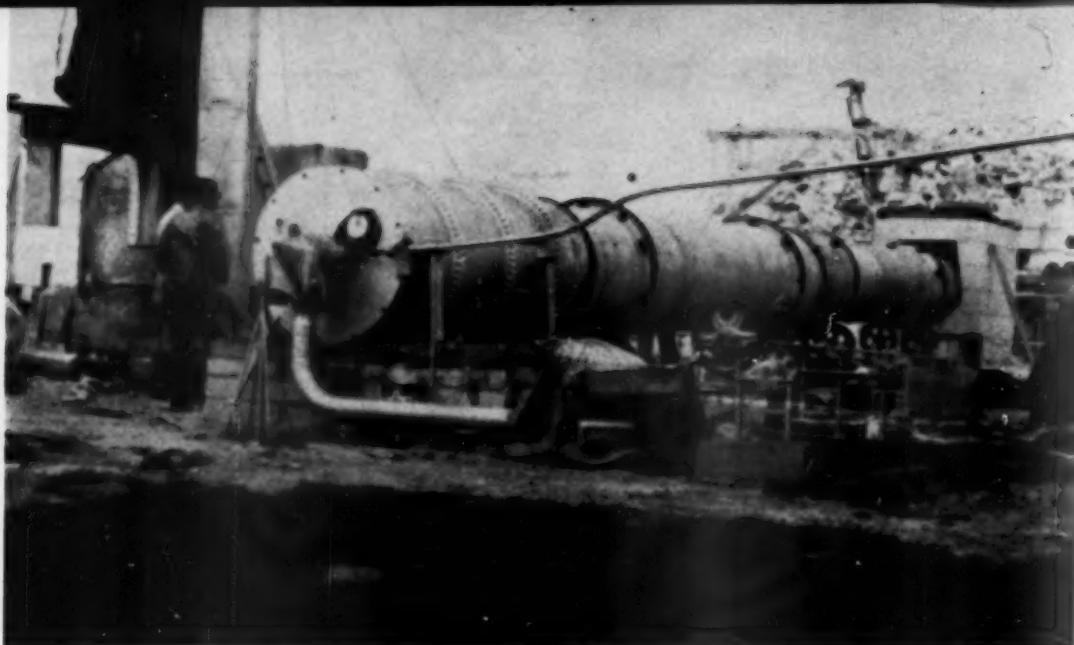
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**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



**A wasted effort.** Rotary kilns are of impossible size and unwieldy arrangement

## Lime in Australia

*continued from page 94*



**Mr. Azbe** with an Australian Koala Bear

sate for the deficiencies of the poorer stone. It is not easy to make a fairly good lime from poor stone, but it is possible within limits.

Initially there were two main objectives to my world tour, the obligations to our Australian client, The Hydrated Lime Ltd. of Adelaide, and to our Norwegian client, Norsk Hydro Elektrisk of Oslo. For one I was to arrive in Australia in Octo-

ber, for the other in Norway in November. The question was not how to get to Australia, but how to get from there to Norway!

A study revealed four separate and widely divergent routes, little different in cost and in time required. These show how the world is shrinking, making technical and commercial cooperation, as exemplified by my own trip, more readily possible. I am listing these four possible routes that were undreamed of until a few years ago.

The first was to take a direct flight from Sydney across United States to London, from there connect with SAS to Oslo. The second was to fly from Sydney and to transfer in Tokyo to an SAS plane flying over the North Pole to Copenhagen and to Oslo. The third entailed flying by way of Hong Kong, Calcutta, Karachi, Istanbul and Zurich to the Scandinavian countries. The fourth was from Darwin, or Perth, across the immense span of the Indian Ocean to South Africa, then up the continent to Kenya, Sudan and on north.

Four ways! Each as divergent as the world is wide and, since land for an air field has been located at the South Pole, which would shorten the flight from Rio to Melbourne by 6,000 miles, there will soon likely be a fifth. Of the four, the American, the Polar, the Indian and the African, the last was chosen because a lime engagement developed in Transvaal. Besides, an irresistible inner urge demanded a visit to Nairobi and the African game fields. It was an interesting route in all respects.

Long distance flying is quite tiring. There may be individuals who can relax and arrive rested, but there cannot be many. Refueling stops are breaks

*Please turn to page 98*



# YES ☐ or NO ☐ ?



Photo shows how a regular program of maintenance with grader can keep haul routes smoother... can help you boost the number of hauler round-trips. Grader is raising the practical speed-limitation of this road at least 5 mph. How many extra tons would that produce at your digging... daily? ... yearly?

**Are you getting top possible output?  
Is your cost-per-ton as low as can be?**

Check your answers to the following questions. Then consider how the services of additional, fast-working graders — or more extensive use of present machines — can step-up output... cut operating costs... boost net profit.

Yes ☐ No ☐ **Do you blade haul roads regularly?** Smooth-graded roads speed hauling, for more trips per day... cut hauler downtime, reduce tire wear, make roads safer.

Yes ☐ No ☐ **Do you keep pit floors clean?** Do you clean-up quickly after blasting? A regular program of clean-up pays-off. Maintenance of wide, clear traffic-ways makes all areas quickly accessible by shortest route. It speeds loading and hauling... prevents accidents... reduces wear on tires and machines. Regular clean-up, and good drainage prevents dirt and refuse from weathering into ore, minerals, or coal below the floor.

Yes ☐ No ☐ **Do you practice good housekeeping around plant?** A clean plant area speeds equipment traffic, reduces dust, increases efficiency. It pays to keep roads, runways, and working areas neat, clean, and

workable at all times by leveling or removing fall-off from heaped trucks... spillage from around crushers, grizzlies, conveyors, trestles, etc.

Yes ☐ No ☐ **Do you keep stockpile toes pushed in?** Scattered piles limit working space, tend to down-grade material, increase loading costs. A regular program to roll-back thinly-spread toes costs little, pays-off big in time and material saved.

Yes ☐ No ☐ **Do you keep dumps smooth and level?** You speed hauling and dumping, cut costs, when dumps are smooth, level, dry. A grader can handle dump maintenance and drainage quickly. Its offset blade reaches far out beyond wheels to safely cast material clear over edge. And as it travels to-and-from the dump, grader smooths your haul road.

Yes ☐ No ☐ **Do you promptly clean washed-down dirt off benches?** Every rain may wash dirt onto upper benches... may lower the quality of rock and ore below. Prompt grader service halts "wash," provides planned drainage, piles refuse for easy removal by scraper or loader and truck.

Yes ☐ No ☐ **Do you put a grader on your exploration or development "teams"?** A modern grader can build a smooth well-drained roadway in a matter of hours... can speed exploration work by maintaining good access roads for quick transport of men, supplies, and equipment.

Yes ☐ No ☐ **Do you keep ditches clear... drainage open?** Just a few hours of grader work per week on ditches along roads, in pit, and elsewhere, will keep drainage open... assure fast run-off. A planned drainage system and a regular maintenance program prevents seepage of dirty water into pit bed... minimizes break-up of haul roads... keeps haulers and shovels operating on dry footing.

*Before you buy any grader, be sure to get complete information about fast, powerful, L-W Adams' Model graders. These LeTourneau-Westinghouse machines are offered in weight, power, and price-ranges that will exactly fit your needs. Seven models: 190\*, 160, 135\*, 123, 115, 80, 60 hp. Choice of GM or Cummins engine on 6 larger models. Write for details.*

\*With torque converter †Trademark G-1872-MQ-1



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An incongruous combination—field kilns; a modern hydrator

## Lime in Australia

*continued from page 96*

but not rests. Still, to fly from the U.S. to Australia, a distance of around 8,000 miles in less than two days, is better than rolling and pitching on a steamship for three or more weeks.

On landing in Sydney I was dozey and confused from the flight. After all, I found myself on the opposite face of the earth! Then there were the Customs inspectors and Immigration officers to pass, but with the greatest courtesy, they just waved me by. It was not so easy to pass the newspaper reporters and radio personnel. They were well represented too, as if I were a motion picture actor, rather than a crusty lime burner.

The explanation of this became clear when our client, E. Gordon Evans, Executive Director of The Hydrated Lime Ltd., showed up. He had flown in from Adelaide, 700 miles, to welcome me in Sydney. We were to part the best of friends a month later at Perth, some 3,000 miles away in western Australia. In the meantime, we were almost constantly together, pecking away at lime. Gordon was my friend, client and guide. He smoothed my way, fed me, quenched my thirst and protected me from the aborigines and koala bears.

Australia is immense, just a shade smaller than the U.S. Its population is  $9\frac{1}{2}$  million or three persons per square mile compared to the U.S.'s 173 million, or 54 per square mile! The reason for the difference is the deserts and the inadequate rainfall in the productive portion of Australia; but there are parts that are delightful and destined for high development. All the country needs is capital,

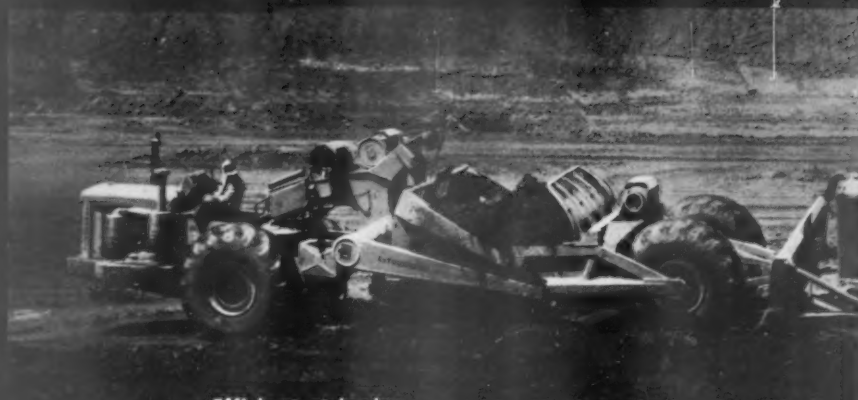
people and the development of practices to increase the output per man. In this we should help them, for many reasons; the fact that the Australians are the best friends the Americans have is but one. They always will be, as they are steadfast people. Australians are most democratic and near to being a classless society. Some do earn more than others, but the range is small and there are no poor people.

An American in Australia is almost completely at home. The sense of being in a foreign country fails to register. He may miss his baseball, but Australians are marvelous sportsmen and about half of any of their newspapers deal with sports.

The continent is so large that I cannot say I saw much of it, even though I traveled 7,000 miles within the country. Besides, most of my time was spent visiting sheep pastures searching for good stone. With the Great Barrier Reef to begin with, Australia has plenty of limestone but most of it would fail to meet our standards of chemical quality and physical make-up. It may be granulating, soft and crushing, shaley and sintering or excessively porous. Hydrated Lime Ltd. wanted a modern kiln but questioned the suitability of the stone they were considering. Chemically it was fairly good, but physically it was quite unusual, and to our mind unsuitable for kilns to be operated at high thermal efficiency and at a low cost of production.

The stone in question was extremely porous.

*Please turn to page 100*



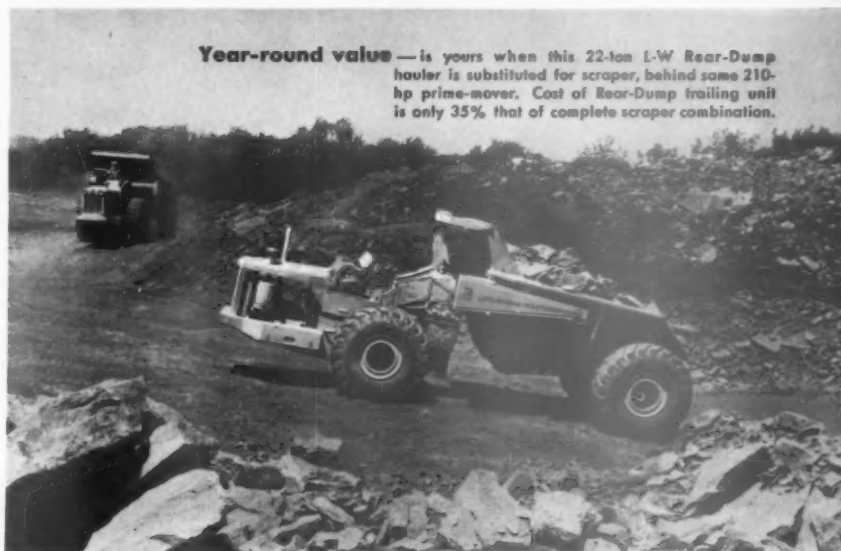
**Efficient stripping** — is certain with this easy-loading 20-ton (18-yd) scraper. Large bowl capacity, and machine's easy maneuverability, speed removal of overburden. Use scraper, too, to repair old haul roads and build new ones, clean up odds-and-ends of earthmoving on your property.

**For shallow stripping,  
this scraper's  
your best bet**

**gives you  
year-round  
service with  
interchangeable  
L-W Rear-Dump**

**T**ime means money when you're stripping varying depths of overburden in your pit. If overburden is free of rock, and is shallow and wide-spread, crawler-type excavators — such as shovels, draglines and crawler dozers — move slowly to new work areas, increase your costs. Furthermore, they can only dig and cast ... require other machines to haul spoil to out-of-the-way disposal areas.

Self-propelled scrapers move shallow, non-rocky overburden at lowest cost per ton. Since stripping is a periodic job, most scrapers are side-



**Year-round value** — is yours when this 22-ton L-W Rear-Dump hauler is substituted for scraper, behind same 210-hp prime-mover. Cost of Rear-Dump trailing unit is only 35% that of complete scraper combination.

lined many days during the year because there is not enough steady work. Not so with LeTourneau-Westinghouse C Tournapull®. When you finish stripping, you simply interchange its 18-yd scraper for a 22-ton Rear-Dump trailing unit. Thus your 210-hp L-W prime-mover works productively for you all the year-round for greater profit.

Cost of the interchangeable hauler trail unit is only 35% of that of prime-mover and scraper combinations. Other interchangeable L-W work units include Bottom-Dump, Side-Dump, and Flatbed haulers.

#### **Tournapull "extras" speed operations**

All off-road L-W Tournapull units have easy maneuverability for work in restricted quarters, instant electric control of all work functions. They have powerful brakes (largest in the earthmover field), dependable power-steer, and exclusive, power-transfer differential which keeps these machines working in soft going when other haulers bog down.

All-around usefulness, and interchangeability of hauled units make L-W 'Pull' a sound investment for your pit. Ask for complete specifications, and a demonstration.

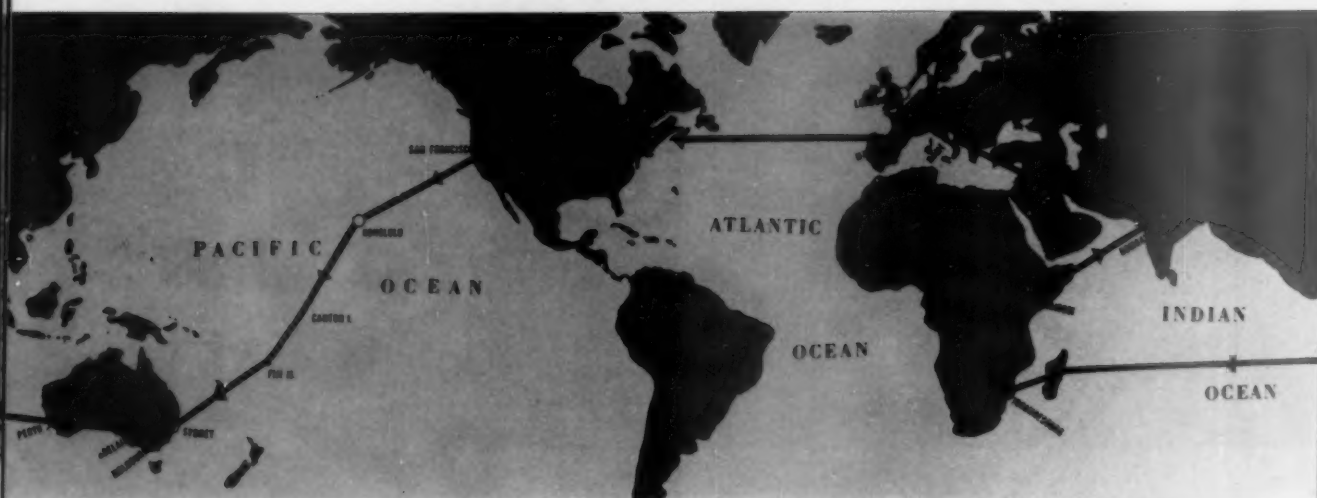
†Trademark CPR-1867-MQ-1



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## Lime in Australia

*continued from page 98*

Its apparent specific gravity was 1.3, that is, half the weight of normal stone. Half the stone was pore space, that in the rain would saturate with water, and would never completely dry out. This water would have to be evaporated before normal preheating in the lime kiln could begin. But actually, preheating never would be normal, because due to the high porosity, the heat conductivity would be low and, after it became lime, far lower than that of ordinary lime.

Lime made from this stone weighed less than half the normal burned lime. To convert it to lime, double the time was required when starting from dry stone. The time would have been more when starting from wet stone. Due to the low heat conductivity, with a high kiln temperature, the surface of the stone would have been overburned, while material at its core remained unburned. With a low kiln temperature, the production rate would have been so low as to be uneconomical.

Worse yet, for a given weight of lime actually produced, twice the normal volume of stone would have to be charged and twice the volume of lime drawn and shipped, if pebble or lump.

Besides, the stone and also the lime were friable, and the resulting fines would have blocked the kiln voids, preventing proper gas flow distribution. This is serious with normal stone and lime and fatal in the case of such a low heat conductivity product.

It is common for lime kiln operators to blame their poor kiln performance on supposed low calcining rate of their stone, but there is seldom much difference when stone is normally dense.

There may be a difference in performance if stone is too large and it does not split under heat, and also a difference if it breaks up too much. Otherwise there is something wrong with the kiln arrangement or with the method of its operation.

However, there will be a difference if stone is porous, like our Indiana stone or the more dense Ste. Genevieve stone. We studied this rather thoroughly, correlating stone porosity with its calcining rate under exact conditions, by calcining cubes of stone, suspended from a balance, in a specific atmosphere of a definite temperature rise rate, and noting the temperature and weight loss per second.

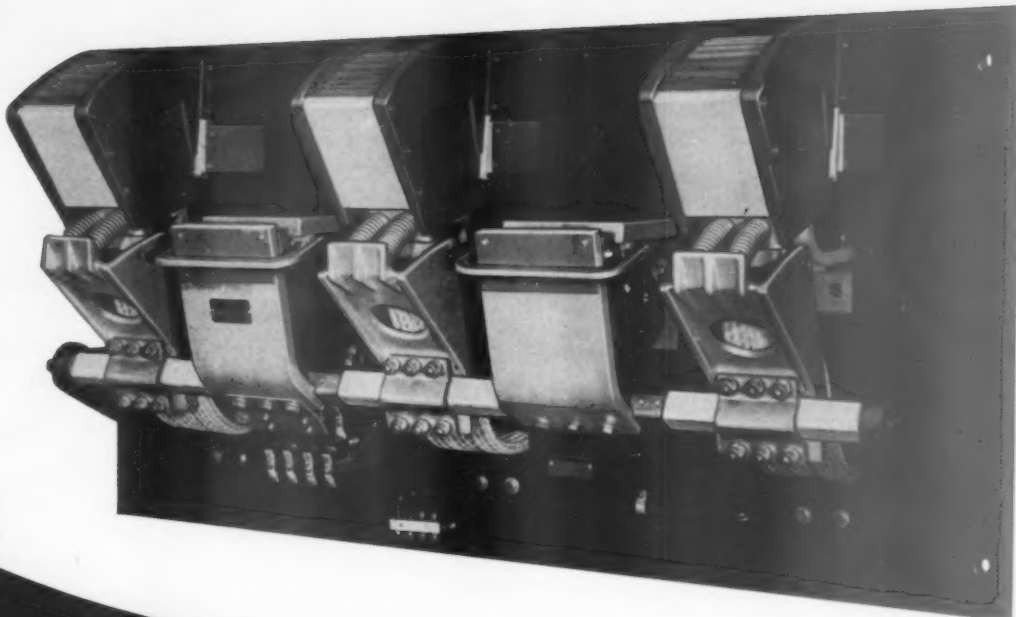
The Argentinian stone (see table 1) is the most dense and fastest calcining. Next is the Chinese. Our Ste. Genevieve is slightly porous and the calcining rate is a bit slower. The Puerto Rican stone is quite porous and slow while the Australian is very porous and very slow in its calcining rate.

The Puerto Rican stone of lower porosity, calcined in vertical kilns, has given plenty of trouble. Therefore, we shied away from the porous Australian stone of even greater porosity, as well as from their Travertine, which is most readily obtained, but which tends to be variable in hardness and quality with a pronounced tendency toward sintering.

Eventually, however, with the aid of the South Australian Dept. of Mines, we found a deposit of limestone that, though it did not compare to the best of ours, would still prove suitable for high production lime kiln operation.

*Please turn to page 102*





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\* 7th meaning, Webster's New Collegiate Dictionary, Second Edition.



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# **ALLIS-CHALMERS**

TABLE I  
Effect of porosity on calcining rate  
high calcium limestone  
¾-in. cubes

	Ste. Genevieve	Argentina	China	Puerto Rico	Australia	
Stone specific gravity	2.361	2.692	2.683	1.742	1.3057	
Lime specific gravity	1.511	1.791	1.611	.9905	.7494	
Weight stone cube—gr.	17.18	20.21	17.77	12.07	8.79	gr.
Weight lime cube—gr.	9.64	11.32	9.97	6.77	4.95	gr.
Percent weight loss	43.90	43.99	44.01	43.91	43.69	percent
Time—preheat and calcine min.	44.25	47.75	44.75	43.00	40.75	
Minutes/gram	4.59	4.219	4.488	6.35	8.232	min.
Rate in time required	1.09	1.0	1.06	1.51	1.91	

## Lime in Australia

continued from page 100

Australian lime manufacturing practices are rather primitive. Keystone kilns—and we know what these are in their original unconverted state—some obsolete rotary kilns that were taken off cement manufacture, some mixed feed kilns and many box-like field kilns are in use.

In one operation there are three of these kilns producing together 40 long tons of lime a week or, on a seven day basis, 2.66 tons per day per kiln! Very little indeed when it is considered that the shaft area of each of these kilns is 110 sq. ft., but the kilns are under fire only six percent of the total time.

The operation of any kiln consists of the charging of stone, the preheating of stone, calcining it to lime, cooling of this lime and drawing the lime. All five periods follow each other separately, and in the modern kiln are, so to say, simultaneous. A modern kiln is charged with stone, and drawn of lime in a matter of minutes, while in these old kilns, hours and even days are required for these operations.

A modern kiln operating continually and with forced draft will produce 50 to 100 tons of lime per day from 50 sq. ft. of shaft area while these older kilns combined produce only 40 tons in a week from 330 sq. ft. of area.

The fuel required is enormous. There is no proper recuperative preheating, no recuperative cooling and, for each fresh charge, the stone and the thick walls surrounding the kiln as well have to be preheated.

Four times as much work is required by these kilns for each ton of lime produced. The work is harder and dirtier, and the lime from the hand laid limestone arches overburned, before the top portion of the stone bed or of the kiln corners is completely calcined.

It is these kilns that govern the market because many are operated by farm families and will continue to be operated until cheap lime is produced in new, economical kilns and is sold at a low price.

Australians are not too well posted on lime and its production—not that they are ignorant, they are great readers, but rather because they are so isolated. Australia is a continent far from the world's industrial centers and Australian lime producers have little contact with one another. They are also still subject to residuals of English over-conservatism.

Their regular plants are inefficient with low capacity and high production costs. Therefore since the sale price of lime is necessarily high, the demand for lime is limited.

But, why should lime be so expensive? Their labor is about half the price of ours and there is plenty of stone. Thus, with labor relatively cheap, both fuel and stone should be cheap. Nevertheless, lime sells for about twice as much in Australia than it does in the United States. Hydrate, for instance, sells at over \$40.00 a ton! Inferior type of lump lime at \$25.00. No wonder little is used—it has priced itself right out of the market!

Australia needs immigration and realizes it, but what it needs more is better labor utilization—not harder work. You could not get an Australian to work hard or work overtime. There is not a single lime kiln in the U.S. that is charged by men pushing a wheelbarrow up a plank, but you will find them, and many, in Australia.

But it is not all so. There is a knowledge of lime and of effective mechanization in Australia but it is captive within chemical companies that persist in keeping all bits of information to themselves. They have the know how and the kilns, but the informa-

Please turn to page 128



## How Dodge saves you money by matching your truck to your needs

Dodge medium- and heavy-duty trucks have always been built from a wide range of "Job-Rated" components to match a truck exactly to your job. This means that you aren't forced to pay for capacity you don't need, and you don't get undersized units that shorten your truck's life. Just look at the range of components today's line of *Power Giants* offers:

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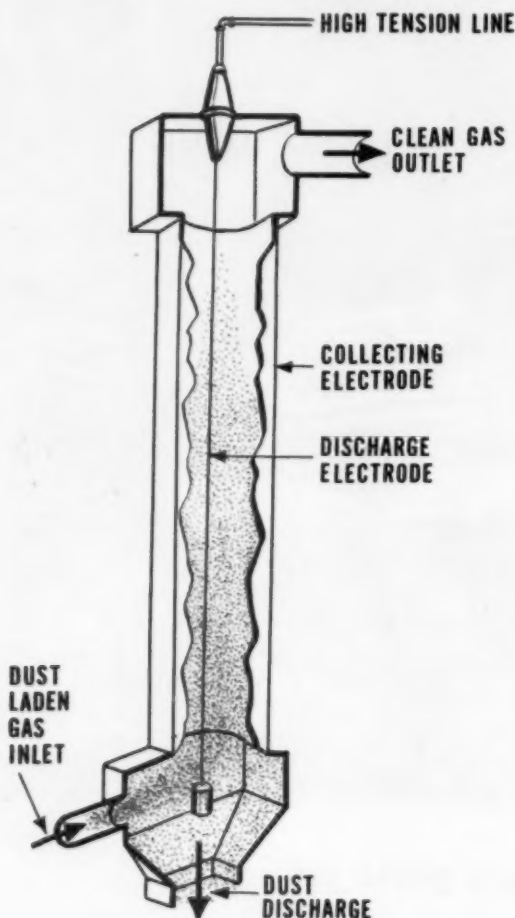
steps. A wide range of "Job-Rated" axles, transmissions, tires, springs and other components makes possible gradual increases in capacity and assures you a dependable, economical truck because it fits your job exactly.

**In economy,** Dodge provides the thriftiest and most efficient engine and transmission combinations. A range of eight engines and eight transmissions, including automatic Torqmatic, makes this possible. You save on gasoline, too, because Dodge engines operate efficiently on regular gasoline!

Priced competitively throughout the line, in many models Dodge is priced *lowest!* No matter what Dodge *Power Giant* your job calls for, you'll be agreeably surprised at its thrifty price tag. See your Dodge dealer soon, and get his special 40th-Anniversary deal!

# DODGE *Power Giants*

## How an electrostatic precipitator works



**T**HE FORTUNES OF THE CEMENT industry and the electrostatic precipitator have been linked since 1910, when the first commercial high-temperature precipitator was installed in a cement plant. The basic principles in precipitator operation haven't changed much. But past advances in application and the laboratory developments now underway promise to make dust collection even more important in the future. This article discusses the design and function of these units as they now are applied to the cement industry.

To begin with, the greatest problem in the cement plant is that of kiln gas cleanup. The problem varies from plant to plant, from kiln to kiln, and from one raw material source to the next. We have in kiln systems the standard dry process plant, the wet process plant, the filter cake feed plant, the

\*Mr. Plass is Industry Engineer for Cement and Mr. Hoaland is Chief Technical Engineer, Western Precipitation Corp., Los Angeles, Calif. This article is a condensation of a paper presented at the Electrostatic Precipitation Seminar, Pennsylvania State University, University Park, Pa., June 16-21, 1957

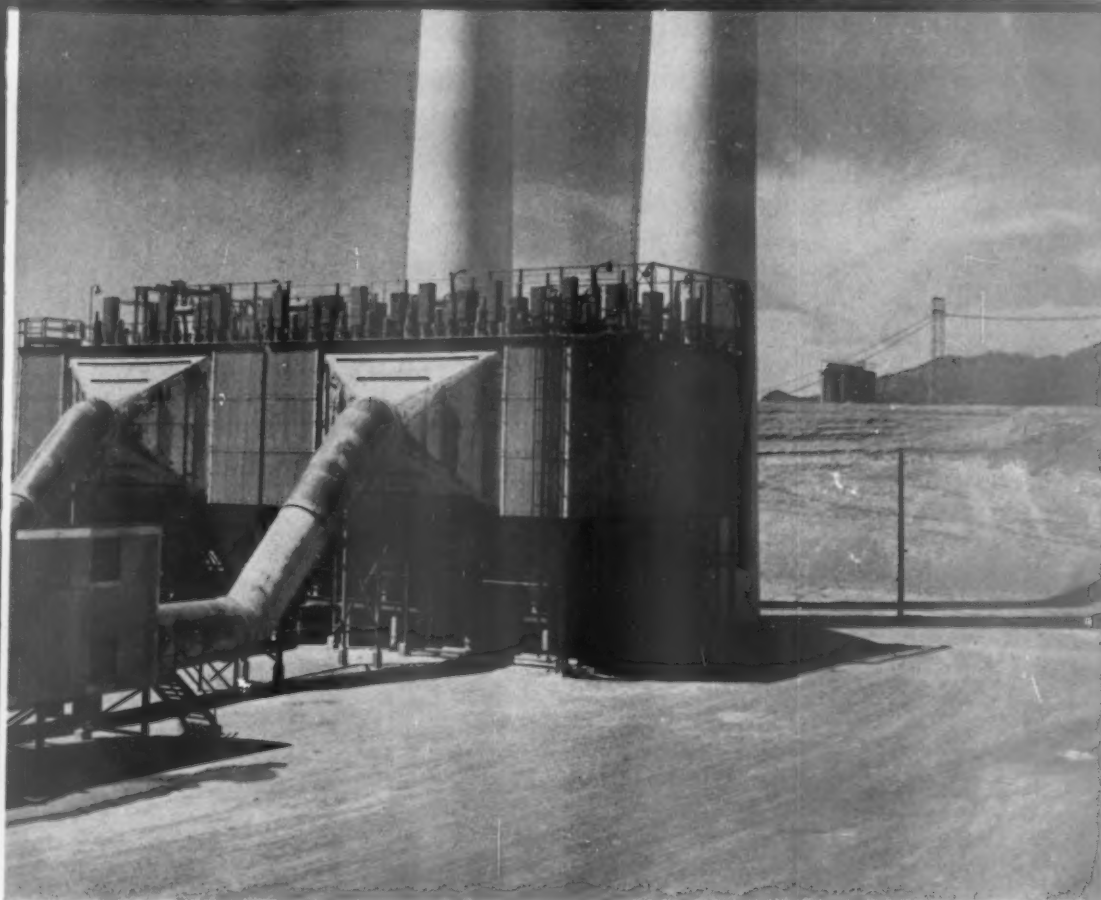


Fuller-Humboldt preheat system plant, the Lepol kiln plant, the ACL system plant, and several modifications related to all of these.

The extent of the kiln gas cleanup problem may be illustrated by comparing the weight of these gases with the weight of other materials entering the process. A typical dry process kiln rated at 3,000 bbl. of clinker per day consuming 150 tons of coal and 900 tons of raw material plus combustion air will yield 540 tons of clinker and 4,320 tons of kiln gas effluent. Kiln gases far outweigh the other materials handled—one reason for precipitator equipment and auxiliaries representing such a large expenditure. However, the quantity of kiln dust produced in any plant varies widely, with some typical figures in table A.

The electrostatic precipitator manufacturer faces two fundamentally conflicting problems. First, he wishes to maintain his reputation by installing equipment designed and sized to cope with the worst conditions likely to arise in plant operation. Second, he must work in an extremely competitive atmosphere which favors the least expensive piece of equipment with the greatest assurance of good operation. It becomes necessary to know the complete analysis of the feed, the resistivity characteristics of the dust, plant practice in dust return,





# Electrostatic precipitators

## A discussion of their design and functions

By R. J. PLASS AND H. H. HAALAND\*

plans for increased production, and the dust production of the kiln to give sound recommendations with wide variations in raw feed characteristics.

The problem created by alkalis is a prime example. Alkali volatilization depends on two factors—the time and temperature of burning and the specific alkali compounds in the raw mix. Alkali salts volatilize slowly at burning temperatures, and kiln burners and firing practice attempt to volatilize and drive them out of the kiln with the gas stream. While a partial volatilization is readily accomplished, it is exceedingly difficult to obtain complete volatilization.

The returned sulfates are more difficult to volatilize than the freshly liberated alkalies. As this material is condensed as the gases cool an exceedingly fine alkali fume is formed, and we now

have a material difficult to precipitate. In the operation of a precipitator we then have two fractions, one a dust fraction of largely cement-making constituents ( $\text{CaO}$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{Fe}_2\text{O}_3$ ,  $\text{MgO}$ ,  $\text{SiO}_2$ ), and the other alkali fumes. We find a fractionating effect in collection, with cement-making constituents being caught to a greater degree in the first sections of a precipitator and the alkali fraction in the later sections.

**Dust return.** The alkali problem leads into the problem of the return to the kiln of the collected dust. If the kiln gases were carried into a precipitator having 100 percent efficiency, all the volatilized alkalis would be collected with the dust. If the dust were then returned to the kilns, the amount to be revolatilized to produce acceptable

*Please turn to page 108*



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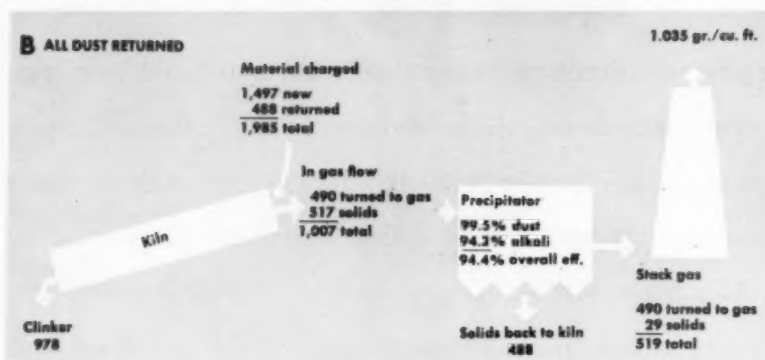
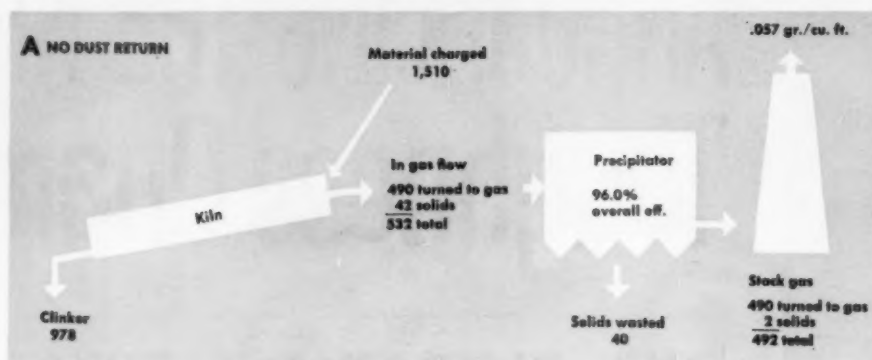
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ROCK PRODUCTS, July, 1958

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### Dust Flow in Cement Making Process

Figure B shows far more dust in the kiln exhaust gas than Fig. A. The alkali in the dust in Fig. B builds up in the system, since the returned alkali does not enter the clinker, as does the cement dust. If all collected dust is returned to the kiln, 1.2 percent of total cement production is recovered; and air pollution is cut from 42 lb. of dust per minute to 29 lb. with the precipitator and dust-return setup. Air pollution can be cut to 2 lb. per min., Fig. A, if no dust is returned

## Electrostatic precipitators

*continued from page 105*

clinker would rise. As this cyclic operation continued, the alkali content of the dust would quickly rise to prohibitive values, making it necessary to purge the system.

One hundred percent efficiency is unrealistic; however, efficiencies close to this point are becoming a necessity from an economic as well as from an air pollution requirement: The problem is a real one in practically all new installations. The question arises as how the manufacturer can guarantee the high efficiency of a precipitator as it varies through the cycle until enough alkali escapes the stack or is absorbed by the clinker to balance that brought into the system with the feed. The only mutually satisfactory answer to date has been to guarantee cement-making constituent collection only where dust return is practiced, or to guarantee over-all dust recovery only where no dust return or partial return is made.

Sulfur is another problem affecting a precipitator which is introduced by both kiln feed and fuel. Sulfur in the fuel and feed appears in the gases

mostly as condensed sulfates. The sulfur in the fuel goes to  $\text{SO}_2$  which combines with the alkalis and also combines with the lime if the alkali fume is low. Most of the sulfates generated break down at kiln temperatures and tend to condense out as solids as the temperature is lowered. If this recombination or condensation is taking place in the temperature range at which the precipitator is operating, a very hard crusty deposit of 15 to 45 percent sulfur as  $\text{SO}_3$  is formed on the various internal members of the precipitator.

This buildup in the discharge system can lower efficiency and no amount of rapping will remove it from the electrodes. The only satisfactory solution is lowering the operating temperatures in the precipitator so that this condensation takes place ahead of the precipitator.

**Wet process plant.** Some of the problems of dust control are peculiar to the major cement making systems. The wet process produces the most favorable conditions for electrical precipitation because of the amount of water vapor in the gases. The dust problems of the process are largely mechanical in nature which can be solved by prop-

*Please turn to page 110*





## Wisconsin Quarry Adds 50-R to Speed Up Blast Hole Drilling

Just north of Wausau, Wis., Foley Brothers installed a 50-R drill at a rock quarry. Formations run to tough, hard-to-drill quartz and granite. Even in material like this, Bucyrus-Erie rotaries put down a lot of hole—fast.

Among the many advantages offered by the 50-R, two make it especially fitted for the material it is drilling at the Foley Brothers quarry. They are *variable drilling speed* and *variable down pressure*.

For controlled speed, the Ward Leonard variable voltage system gives the operator smooth, instant command over rotation of the drill pipe. He can choose the most efficient speed for a given formation. To meet requirements, he can vary

the speed without stopping the drilling operation.

Hydraulic pulldown provides controlled load on drilling tools. For greatest possible penetration in hard rock, maximum down pressure can be exerted on the bit while the drill pipe is turning slowly.

The 50-R at Foley Brothers is a full-electric rig designed for drilling 9 $\frac{7}{8}$  to 12 $\frac{1}{4}$ -in. holes. For drilling 6 $\frac{3}{4}$  to 9-in. holes Bucyrus-Erie offers the 40-R with either full electric or diesel-electric power.

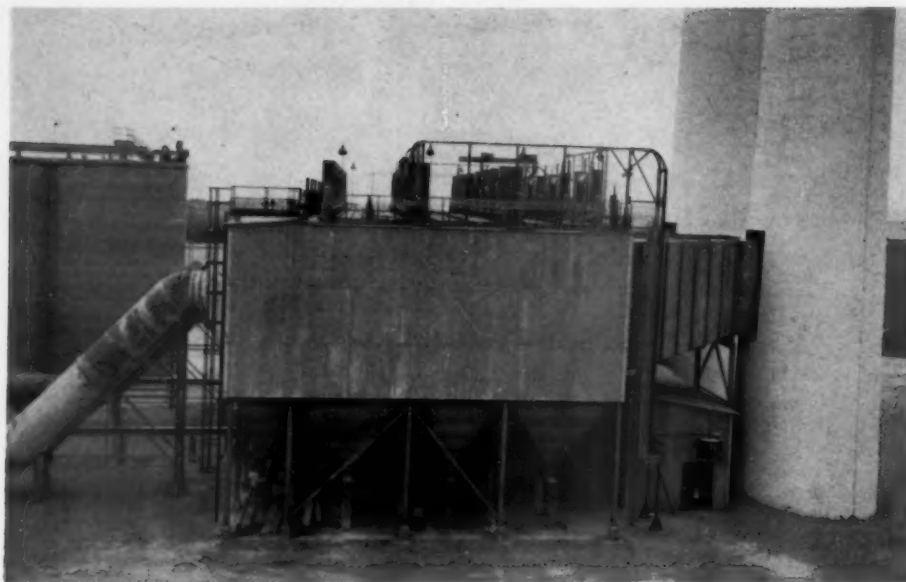
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Side view of electrostatic precipitators shows rectifier transformers on top, and hoppers for

collected dust beneath the housing. These photos show California Portland's Mojave plant

## Electrostatic precipitators

*continued from page 108*

TYPICAL DUST LOSS FROM KILNS  
(no precipitators)

Plant Output bbl./day	Process	Dust Load g./cu. ft.	Total Dust tons/day	Dust lbs./bbl. feed	Dust, as percent of kiln feed
5,600	wet	.75	25	8.9	1.5
2,700	wet	5.94	65	48.1	12.9
2,250	dry	2.10	21	18.0	3.0
8,000	dry	6.10	240	59.5	9.6
1,600	F-H	3.9	42	52.2	13.8

er insulation and hopper design. However, the very high efficiency units give difficulties with high alkali, light bulk density collected material. In some areas precipitated dust will contain between 40 and 55 percent alkali and have a bulk density of 7 to 8 lb. per cubic foot. Pyramidal hoppers with specially enlarged outlets, long "V" hoppers, and drag conveyor hoppers have been used to solve these problems.

The filter cake feed system has been one of the most variable of all systems in dust precipitation characteristics. As the gas and dust vary, precipitator operation often swings suddenly from good to poor and back again. One plant runs well with about 12 percent moisture by volume and the next requires at least 18 percent for good results.

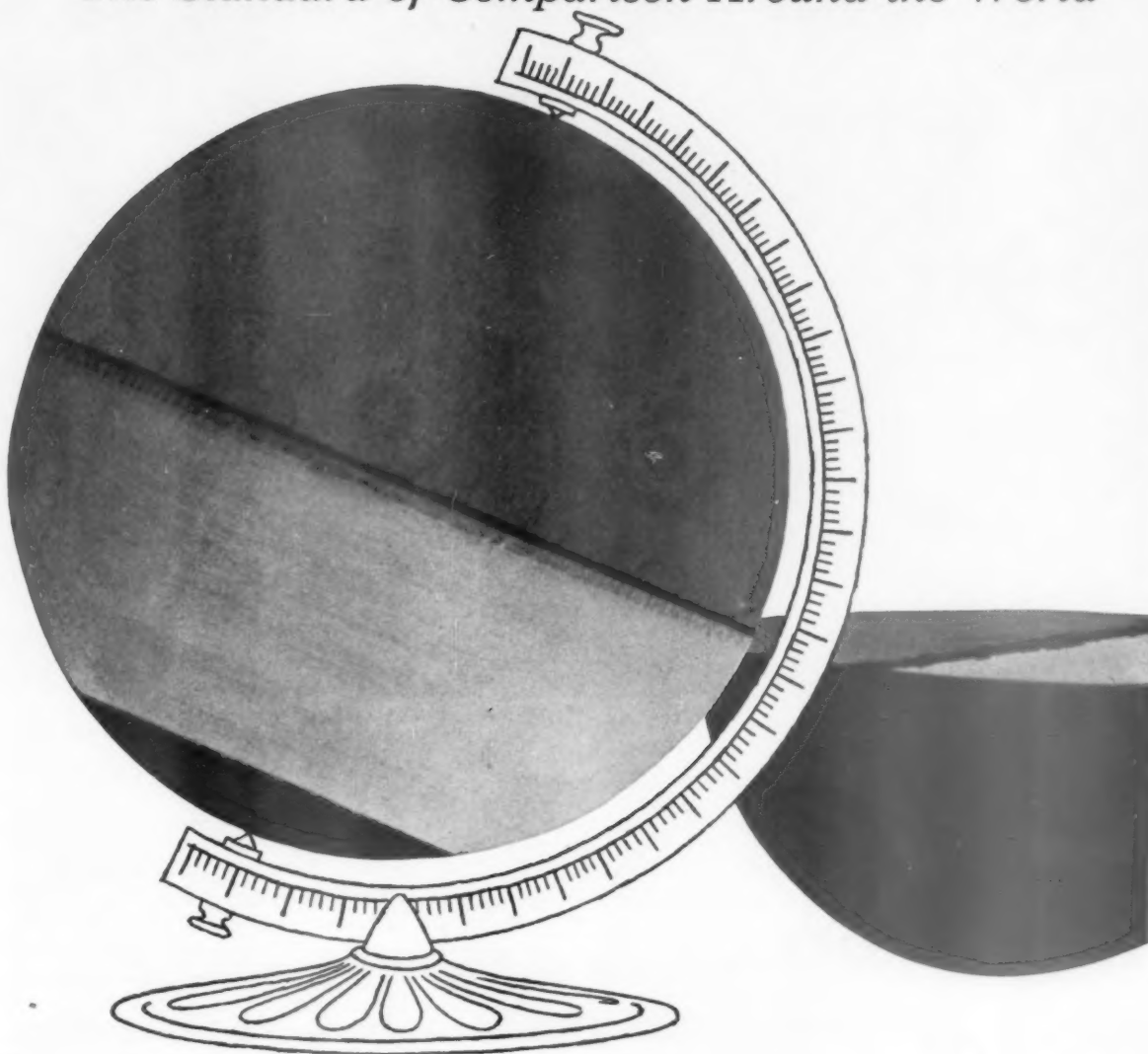
The effects of air dilution at kiln end housings and leaky flues become multiplied as every effort is required to maintain the highest possible moisture content in the gases. Dust return complicates the problem by reducing the water available for conditioning. Intensive maintenance effort throughout the system and close control of the burning operation itself have been the rule in the plants achieving good collection with this system. Constantly changing feed and fuel rates can easily become the most important factor in the collector's performance. Automatic precipitator controls are regarded as very useful if not necessary to proper precipitator operation in these plants.

The dry process plant represents the most challenging problem in collector design and operation. The first high temperature precipitator ever built was the one on the dry process kilns at the Crestmore plant of the Riverside Cement Company. This precipitator has been on the line since 1912 without major alteration, collecting over 1,220,000 tons of dust to date: It still functions at efficiencies equivalent to those originally achieved.

Where the problems of resistivity and sulfate buildup exist, the desire for lower temperatures for the one problem and high temperatures for the other creates a dilemma. This situation has led to continuing investigation and a new pattern of gas treatment has evolved with the introduction of water sprays into the kiln end housings. Gas volumes are reduced as air dilution for cooling is cut to a minimum. Efficiencies are raised with both

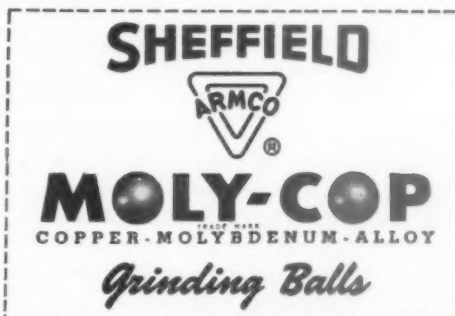
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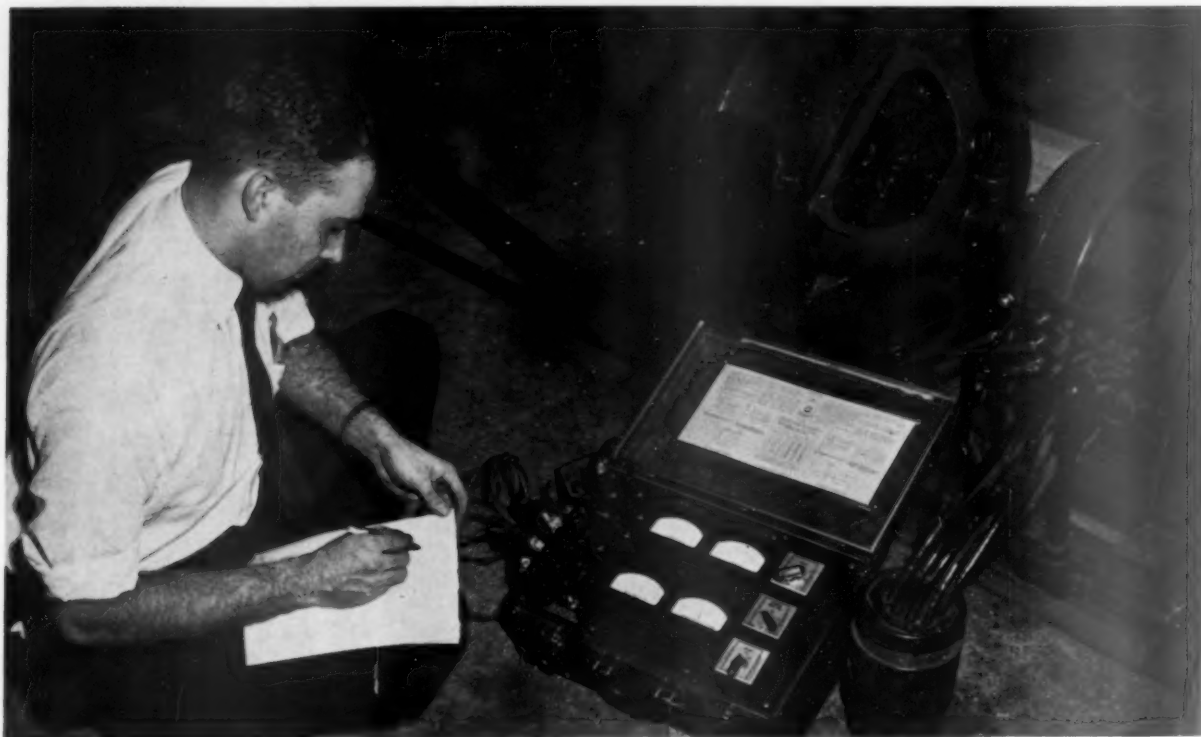
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**Instruments available** for studying motor loading and performance range from the simple tong ammeter to this portable motor analyzer

## Part II

# Induction motor maintenance

By J. W. SAMZELIUS AND R. F. WOLL\*

**W**HILE THE EXPERIENCED ENGINEER can often determine the reasons for trouble in an induction motor by examining the damaged bearing, material defects in the bearing or in the lubricant can usually be determined only in the laboratory. Conditions such as misalignment, overload, damage in mounting or damage from vibration or from electric current leave typical markings in the race-

ways that are easily diagnosed if the bearing is not a complete failure.

By finding out what caused the bearing to fail, we can usually avoid repetition of the trouble. Since lack of grease, overgreasing, unsuitable grease and dirt introduced with the grease are factors causing trouble, it is important to differentiate between ordinary bearings and sealed bearings, from which these hazards are practically eliminated.

Some of the more typical indications or markings resulting from various causes are described below. More detailed information, including excellent picture reproductions of bearing damage is published by The American Society of Lubrication Engineers, 84 E. Randolph Street, Chicago.

**Grease—too much or too little.** A bearing which has failed because of lack of grease will probably show discoloration due to heat. The heat may also have caused the grease in the bearing to burn and carbonize, forming a black dry powder in protected places of the bearing. Such a bearing usually shows wear and feels rough and loose in turning. It may also be very noisy prior to failure.

Overgreasing may also cause the bearing to run

*Please turn to page 114*

\*Motor Engineering Dept., Westinghouse Electric Co. Part I of this series was published in the March, 1958, issue of *ROCK PRODUCTS*, page 118



**B.F. Goodrich**



## **B.F. Goodrich Rock Logger tires can be retreaded 3 times, ready-mix company reports**

**G**RAYSTONE of Olympia, Washington specializes in ready-mix concrete. Trucks travel on and off-the-road in stop-and-go service, rolling over such tire-killers as rocks and steel scraps at construction sites. Yet Graystone finds its tires often can be *retreaded 3 times* with practically new tire service from each retread. Why? Graystone uses B.F. Goodrich Rock Logger tires!

Graystone Dispatcher George Meyer says, "B.F. Goodrich Rock Logger tires give the kind of traction we need in rough weather." Husky Rock Logger cleats dig in to give you maximum pulling power in forward or reverse. "They give rugged dependability around

rough construction work," he adds.

B.F. Goodrich Rock Logger tires are available with FLEX-RITE NYLON cord construction. FLEX-RITE NYLON withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. Result: This B.F. Goodrich cord body outwears even the extra-thick Rock Logger tread, can often be retreaded again and again!

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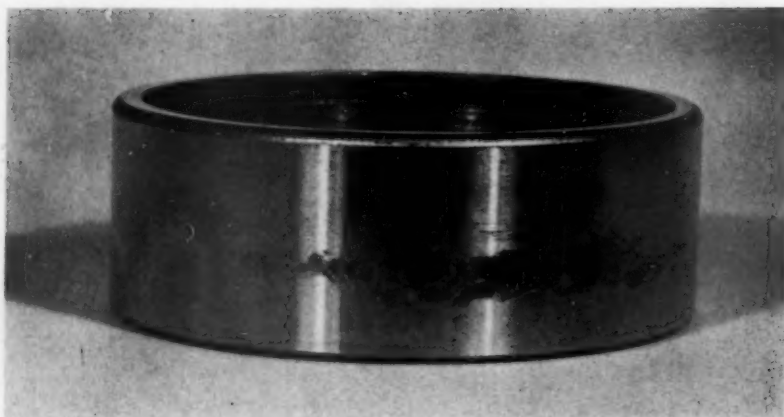


# **B.F. Goodrich truck tires**

ROCK PRODUCTS, July, 1958

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A first sign of damage to bearings by vibration is discoloration and shallow pitting around the outside of the outer race. Called fretting corrosion, it appears where pressure and movement exists

## Induction motor maintenance

*continued from page 112*

hot and fail. There may be an oversupply of grease in the bearing, probably mixed with carbonized grease to form a black, semisolid dough. Grease may also be found inside the motor where it may have caused damage to insulation. The bearing will probably be discolored from heat.

**Overload.** Bearing failures entirely due to overload are rare since the useful life of a bearing under known load conditions can be predicted quite accurately. But in belted applications where the load is not definitely known, it is sometimes greatly in excess of what is estimated as normal. This is usually due to poorly designed belt drives or careless belt adjustment which will result in unsatisfactory belt life as well as in bearing trouble.

In coupled applications, the bearing loads are normally very light and the useful life of the bearings is ordinarily very long. However, if the lineup between shafts is poor, vibration and side load imposed by the misalignment may greatly reduce bearing life. If the spacing between the coupled machines is not made properly, thrust loading on the bearings may cause failures.

Typical signs of overload are fatigue pitting or flaking in the area subjected to the heaviest load. If pitting appears in the center of the ball track and is distributed all around, the bearing has been overloaded radially. If the pitting appears only in two diametrically opposite locations, the bearing has been squeezed oval by an oval housing. If the pitting is offset to one side, fatigue is caused by thrust load, and if the pitting shows weaving from side to side, the bearing may be misaligned.

Hard particles or dirt may cause pitting in the raceways, but the marks are apt to be isolated and

located irregularly. The edges of the craters are usually smooth and flattened in contrast to the edges of fatigue pits which are jagged and sharp. Damage from dirt is more common in the outer raceway, since centrifugal force tends to force heavy particles in this direction. Fatigue damage is more likely to show up first in the inner race since the balls pass a given spot more frequently on the inside track. A bearing containing hard particles will usually emit a variety of noises as the particles shift. When turned over slowly by hand, the bearing will feel rough and show a tendency to stick.

**Abnormal external causes.** Sometimes bearings may suffer severe damage from abnormal external causes. One such cause is the circulation of an electric current through the bearing; another is vibration in the foundation in standby machines or during prolonged shutdowns. Transverse dents or grooves may appear in the raceways from both causes. The grooves from electric discharges have dull surfaces and are distributed all around, resembling a miniature washboard. Dents from vibration at standstill are spaced at the exact spacing of the rolling elements, primarily on the load side, and have shiny and polished surfaces.

Electric discharge may be due to static voltage built up by belt friction or by air friction in a dusty and dry atmosphere. It may also be due to voltage generated in the machine by an unbalanced condition in the magnetic field, perhaps caused by a shorted coil. Rewinding the machine or simply discharging static voltage to ground, or bypassing the bearings with a shunt from a collector on the shaft to ground may correct this. In pedestal-type bearings, it may be practical to insulate the bearings from ground.

An unbalanced load on the shaft can produce very destructive vibration forces which must be eliminated by proper balance of all rotating parts.

*Please turn to page 116*

# PRODUCER

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The insulation resistance of stand-by motors is particularly susceptible to moisture. A "megger" is a useful tool for periodic checks

## Induction motor maintenance

*continued from page 114*

The rotor is balanced on the shaft before the machine leaves the factory but pulleys or fans must also be in balance.

**When a bearing has failed** or shows indications of early failure, it must be replaced with a bearing of the same type. While replacement bearings are preferably obtained through the manufacturer of the motor, commonly used bearings are standardized, and replacements can usually be obtained locally.

When mounting the bearing on the shaft, do not use pressure or blows on any part of the bearing except the side of the inner race, with a squarely cut-off tube of slightly larger bore than the shaft and slightly smaller outside diam. than the inner race. Work grease into the bearing from both sides, using a clean wood paddle or clean hands, and fill about one-fourth or one-third of the housing space with grease at the time of assembly.

Proper functioning of the sleeve bearing depends entirely upon the existence of an oil film between the journal and the bearing. The common method for supplying oil to the point of entry in the bearing is by an oil ring rotated by the journal, which dips into a reservoir of oil below the bear-

ing. If the ring should slow down or stop, or if the oil falls below a certain level, the bearing will probably fail.

At starting, the journal is carried directly by the bearing, without the benefit of an oil film. The number of revolutions required to establish the oil film depends chiefly on friction between the ring and the journal; drag of the oil on the submerged part of the ring; inertia of the ring; physical dimensions of the ring; the acceleration and final speed of the journal; and the speed at which the oil flows through the bearing.

Depending on these factors, there may be considerable variations in the wear and useful life of the bearing. Generally a sleeve bearing subject to frequent starts is more subject to wear than a bearing running at uniform speed for long periods.

For these bearings, use oil of proper viscosity and give special attention to the oil ring if the oil is very cold when the motor is started. The oil must, of course, be maintained at a proper level, although this level may change between running and stationary conditions. Whenever you check the oil level, check proper functioning of the oil ring.

When bearings are replaced, examine the oil ring for roundness. If worn or polished spots appear on the interior surface, it should be replaced. Proper functioning of the oil rings is so important that extreme care should be taken in checking and handling the ring when assembling the bearing.

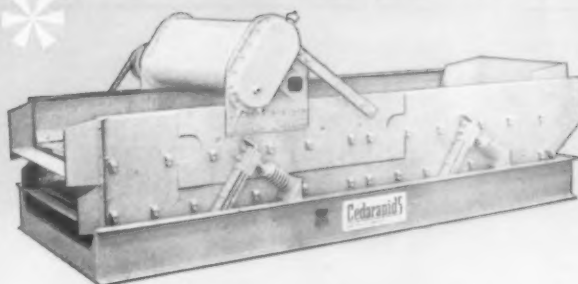
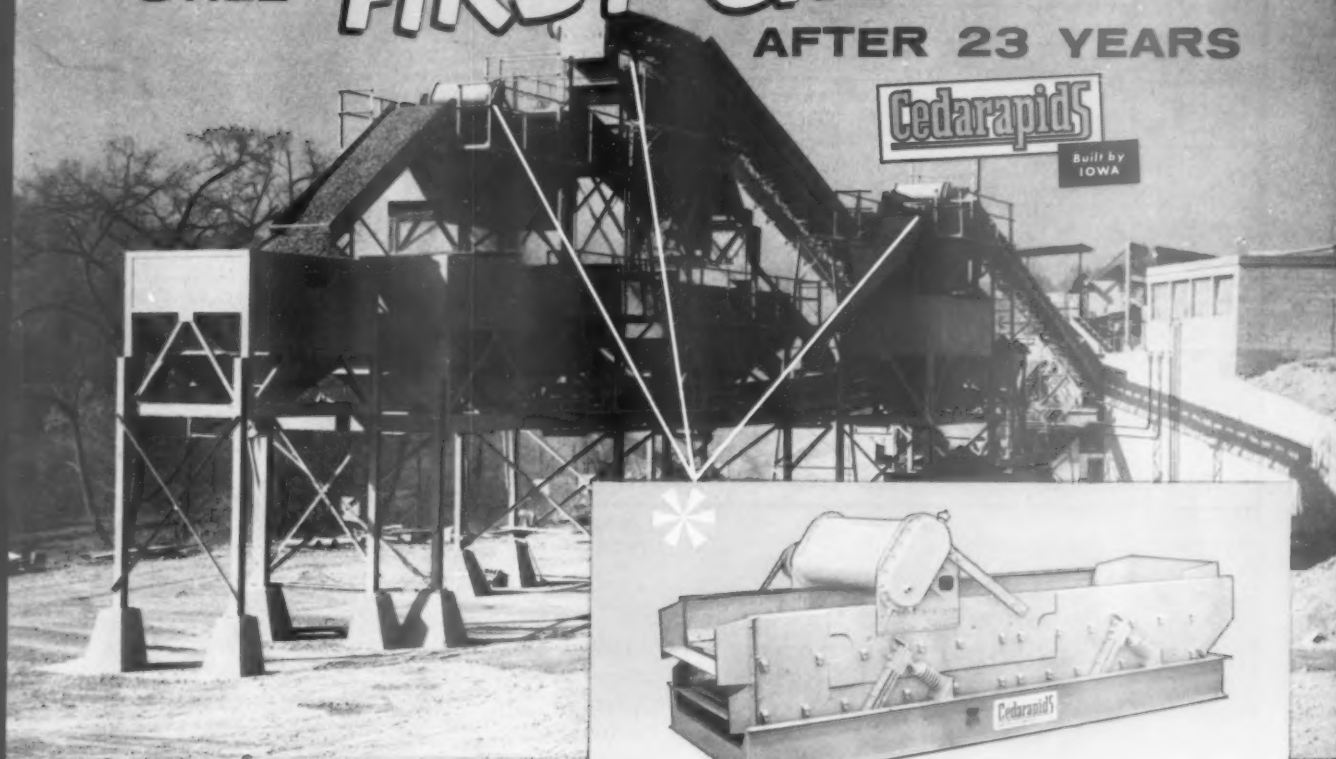
*Please turn to page 118*



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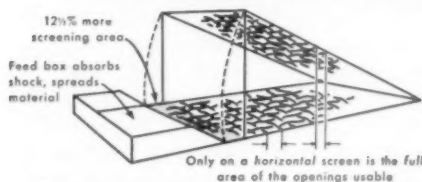
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Since way back in 1935, Cedarapids Horizontal Vibrating Screens have been the standard of profitable production. Because of their *horizontal* design, Cedarapids Screens give up to 30% greater screening capacity, assure more accurate gradation, and increase over-all plant capacity by their more efficient, snappy, live vibratory action. Because of their expertly engineered design and top quality construction . . . typified by fully stress-relieved boxes and screen frames . . . Cedarapids Screens have a long, trouble-free service life.

Today, Cedarapids Horizontal Vibrating Screens are the ONLY screens on the market with the high production performance and the low maintenance durability that result from Cedarapids' quarter of a century of practical, proved-on-the-job experience.

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General Operating Characteristics					Intended usage	Typical applications
NEMA Design	Locked Torque	Pull-out Torque	Locked Current	Slip		
A	Normal	High	Normal	Low	Infrequent starts with relatively light starting load; long running periods at normal loads with occasional short duration peak loads; continuous operation at slight overloads under certain conditions.	M-G sets, fans, drill presses, lathes, pumps, grinders, conveyors, machine tools, slusher hoists, compressors.
B	Normal	Normal	Low	Low		
C	High	Low	Low	Low	Infrequent starts with relatively heavy starting load; long running periods at normal loads; limited capacity for peak loads and overload.	Electric stairways, pulverizers, compressors, conveyors.
D	High	—	Low	High	Intermittent rated: frequent starts with heavy starting load and short operating periods.	Cranes, hoists, winches, valves, elevators.
					Continuous rated: light running loads alternating with frequent momentary peak loads; reversing service.	Punch presses, tapping machines.
F	Low	Extra Low	Extra Low	Low	Similar to Design B but where extra low locked current is necessary and low torques are acceptable; lack of torque margin restricts overload capacity; imperative that load requirements match the motor rating.	

Tabulation of operating characteristics, intended usage and typical applications for five NEMA motor designs

## Induction motor maintenance

*continued from page 116*

Since sleeve bearings have very little thrust capacity they must not be applied to a thrust load. Many coupled applications, not ordinarily considered as thrust loads, may produce thrust loading because of characteristics of the coupling. Gear and pin-type couplings, slip clutches and friction drives which are not restricted to very small axial adjustments may produce excessive thrust forces. To ensure that such thrust loading does not develop, the coupling should be one with limited end play; that is, its end play should be only a fraction of the end play in the motor.

Sleeve bearings are usually provided with greater end play than ball bearings and since the shaft, or rotor, is free to move axially, the end play is easily checked. This greater end play is important since axial magnetic forces on the rotor may balance out by a relatively small displacement of the rotor; thus thrust on the bearings due to magnetic forces may be avoided.

Unless thrust load from the magnetic forces can be proven to have caused bearing failure, a tendency for the rotor to run against the bearing shoulder should not cause alarm. These forces usually are small and well within the capacity of the bearing.

**External forces from a misaligned belt drive or spiral or bevel gears are usually of greater mag-**

nitude and must not be permitted. If moderate and unavoidable thrust causes bearing failure, an improvement can often be made by providing more oil for the thrust face of the bearing—extending the oil grooves to and even across the thrust face. Restricting the oil drainage holes near the thrust face may provide more oil where it is needed. The thrust shoulder of the shaft should also be smooth and polished to reduce friction and wear.

When steps are taken to provide more oil to the thrust face of the bearing it becomes more difficult to prevent oil leakage to the interior of the motor. Therefore, the proper way to eliminate bearing trouble caused by thrust is to eliminate thrust itself.

Felt seals at the ends of the bearing are intended to prevent air currents from carrying oil mist into the motor, and to exclude air-borne dust. Air vents in the bearing housing equalize the pressure, preventing air from passing through the bearings.

Sleeve bearings carrying heavy overhung loads (belt loads, for example) are often subject to load concentration at the outer end because of shaft deflection. If worn spots appear at the end of the bearing in the direction of the load, scraping the worn spot will distribute the load over a larger area. The belt load may also be reduced by lessening the initial belt tension.

Dirt, heat, moisture, poor lubrication, and vibration have been cited as the principal causes of mechanical failure of motors. These same conditions are also the chief hazards to the stator winding, and particularly to its insulation.

*Please turn to page 122*

# SMOOTH GOING IN ROUGH ROCK...

at Meadow Rock Co., Springfield, Nebr.

This 1¼-yd. Lorain Shovel keeps hauling units hustling as it digs steadily through rock at the Meadow Rock Co. quarry near Springfield, Nebr. It digs and loads about 1500 yards a day.



Digging rock is never easy, but this 1¼-yd. Lorain Shovel has many exclusive features that make it — along with other Lorains — the smoothest operating shovel you can put in rock. Here are a few:

**"Shear-Ball" Mounting**—This available, revolutionary turntable mounting is like a sealed "Ball Bearing." Eliminates forever all adjustment, maintenance and lubrication problems of old-fashioned roller designs. Turntable revolves freely and smoothly at full load. No downtime for servicing or adjustment means more rock moved per shift at lower cost.

**Torque Converter**—takes the shock and strain out of the hardest digging. Multiplies and adjusts engine torque to match digging demands. Engine can't stall regardless of load. There's more power at dipper teeth.

A telephone call to your Thew-Lorain Distributor will bring you all the facts on the Lorain Shovel best suited to your requirements. And ask him about the on-the-spot Lorain parts and service facilities that are such important plus values when you buy Lorain. See him soon.



## SMOOTH GOING for the operator with "Joy-Stick" Controls

Only 2 levers control all turntable operations through "Joy-Stick" air controls. Yet, all of the old-time "feel" of the machine is retained. There are fewer levers, fewer motions. This ease and simplicity of operation helps your operator produce more with less effort, less fatigue. Full "Air-Ease" Power Control of crawler travel, steering and tread-travel lock also are provided.

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LORAIN**  
RELIABILITY IN ACTION





## "No recession here," say lime men

### Lime stabilization of soils accented at NLA meeting

**B**USINESS IS GOOD," agreed many of the 55 lime producers at the 56th annual meeting of the National Lime Association, May 12-14. Almost everyone at the sessions at the Grand Hotel in Point Clear, Ala., expressed cautious optimism about the 1958 business outlook. A low in production was apparently reached in January, with sales off between 20 and 30 percent, but production has increased steadily since then.

Lime is second only to sulphuric acid as an industrial chemical; its increasing production is a good portent for the economy as a whole. Lime manufacture is a sensitive economic barometer, for it is a "perishable" commodity which must be used soon after it is produced.

At the meeting, several producers expressed concern over the trend toward consolidation in the lime industry. This trend eventually may eliminate many small, independent producers. The loss of markets when good customers become lime producers is also putting more pressure on the small producer.

A spectacular prospective market was described by several speakers. This market—lime stabiliza-

tion of soils—is not new, but after eight years of testing it has proved to be a reliable tool for road construction. A wide variety of soils have been successfully treated under a wide range of climatic and service conditions.

Gen. Louis D. Prentiss, executive vice president of the American Road Builders Association, estimated that nearly 250,000 tons of lime would be used in this way in 1958. This volume will be increased immensely, he said, as shortages of adequate road building materials develop.

This will have great significance for other rock products producers, as lime stabilization becomes another successful technique for beneficiating marginal or low-grade aggregates to make them acceptable materials for road building. Gen. Prentiss foresees that the best use of lime stabilization will be in the construction of the 520,000 miles of secondary roads in the Federal road program.

Lime stabilization of soils has proved to be outstandingly successful in a wide variety of soil materials and road-building aggregates. But it is not a "miracle material," according to Conard M. Kelley, highway engineer of the NLA. The ap-

*Please turn to page 144*



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**Fast**—Up to 20 bags a minute with two men, 8 a minute with one, *steadily*, because it doesn't tire workers.

**Most Economical** and versatile machine for chemicals, feed, fertilizers, and consumer units in SOM paper

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## Induction motor maintenance

*continued from page 118*

**Shorts and winding failures** can be caused by dirt and air-borne dust. It can impair the ventilation and lead to overheating, and it can cause insulation damage when it is carelessly removed. Dry dust can be removed safely by wiping with a clean, dry cloth or by suction. Clean, dry 30-to-50-psi. pressure air may be used for blowing dust from inaccessible places.

When oil or grease makes the dust sticky, the wiping cloth should be barely moistened with a nontoxic petroleum solvent of the safety type. When using these solvents, wear gloves to prevent skin irritation. Avoid unnecessary dismantling of enclosed motors for cleaning. Since dirt cannot reach the interior of a properly designed enclosed motor, it is sufficient to keep the external surfaces clean and the air passages free and unobstructed.

In open motors of older design, it is relatively simple to detect any heavy accumulation of dirt on the windings. Modern drip-proof open motors may not permit similar inspection, but heavy dust in the atmosphere, dirt around the ventilation inlets, high frame temperature, odor of hot insulation, unusual noises, or a marked reduction in air flow may indicate that the interior needs cleaning. The amount of dirt discharged from the motor when an air-hose is inserted in the vent openings may also indicate whether the motor needs to be dismantled for cleaning.

An old rule of thumb states that the life of insulation is reduced by half for every 10 deg. C. increase in temperature above normal temperature. Excessive heating may be caused by overload or by the poor ventilation that results when dirt or other obstructions hamper air flow or heat transfer. If heat may also be due to high ambient temperature, the insulation should be chosen to suit the condition (Class B or Class H insulation).

Allowable operating temperatures, as measured by thermometer on the hottest accessible point of motor adjacent to insulation, are as follows:

Motor Enclosure	Class A	Class B	Class H
Open	90 deg. C.	110 deg. C.	150 deg. C.
Totally enclosed,			
fan cooled	95 deg. C.	115 deg. C.	155 deg. C.
Totally enclosed,			
nonventilated	95 deg. C.	115 deg. C.	160 deg. C.

Moisture lowers the insulation resistance of the motor, making it more vulnerable to shorts and grounds. Take care to protect drip-proof motors from accidental hosing or deflected spray. Before blowing out motor windings with air, be sure that

water has not condensed in the air line. Humid atmosphere will not normally cause trouble if the motor is running continuously since the heat generated in the windings will usually keep the insulation dry.

Stand-by motors should be protected from excessive moisture and the insulation resistance should be checked at regular intervals with a megger to reveal the condition and presence of moisture. If the insulation resistance in a motor decreases appreciably, the windings must be dried before applying power to the motor. This is important where ambient temperature is subject to great and frequent fluctuations or where the atmosphere is exceptionally humid. In less severe locations stand-by motors may be protected from moisture and condensation if they are run for a few minutes once a week.

Take care that grease films provided to protect bearings and machined and unpainted surfaces in the motor assemblies are intact. Where moisture conditions are adverse, machined fits should occasionally be coated with a water-repellent grease. This grease should not be permitted to come in contact with windings or insulation.

Vibration, a common source of insulation and winding failures caused by mechanical fatigue, can affect both conductors and insulation. To avoid failures caused by vibration, check for foundation settling or heavy floor loading which may cause vibration by misalignment; check for excessive belt or chain tension, or shifts in the mounting due to the push-apart forces inherent in spur gearing; check the motor mounting bolts, the bracket bolts, and the pulley or coupling to be sure they are fastened securely.

In spite of all precautionary measures, winding failures will occur from time to time and will require repair. A good maintenance practice for stator windings is to be prepared for failures before they occur. Renewal parts data should be obtained from the manufacturer when the motor is purchased. For motors in critical applications, it may be well to stock the renewal parts in the maintenance department; often it may be desirable to stock complete spare motors. Be sure the storage area for such spare parts or motors is clean and dry. If it isn't, the insulation on these spares may age almost as rapidly as that of motors in service.

To maintain operation at rated load without exceeding the nameplate temperature rise, make sure that the normal motor ventilation is unimpaired. See that any protecting enclosures do not obstruct the free flow of air around the motor. The ventilating passages of open and totally enclosed fan-cooled motors should be kept clean and free of dirt, as should the surface of totally enclosed non-

*Please turn to page 125*

*"Bemis STEPPED-END Multiwalls perform a service for our customers . . . and so for us . . ."*

SAYS E. E. STORMER, OF MARQUETTE CEMENT MFG. CO.

"The same benefits we encountered by using Bemis STEPPED-END Pasted Valve Multiwalls in our plant operation turned out to be benefits to our customers, too" . . . says Mr. Stormer, purchasing agent for Marquette Cement. "We like Bemis STEPPED-END Bags because they pack better and stay cleaner. Naturally, our customers are also in favor of cement bags that don't sift and get dusty. Cars stay cleaner and the bags are easier to handle."

Although Marquette officials now consider the use of these bags *primarily* as a service to customers, they still look upon them as a major improvement in their packing operation, as well. Bemis STEPPED-END bags pack better because of the Diamond O construction, stepped corners and the hand insert.

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- Valve openings stuck closed . . . causing lower production and loss of bags
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- Dusty packages on account of leakage from ends and valve opening
- Bags sticking together in bale or pallet, slowing production
- Excessive breakage (more than 1 bag in 1,000 is excessive)

*Got any of those problems?*

*Sure you have . . . maybe all of 'em.*

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**GREATER SPEED AND MANEUVERABILITY** In stockpiling, loading, and stripping operations that call for speed, the Work Bull 1001 has no equal. Instant reversing without shifting — by simply changing your foot from the forward acceleration pedal to the reverse pedal — lets you get in and out faster. Direct line thrust gives you "bull-dozer" action, and 43° rollback at ground level provides more breakaway, and allows you to get heaping loads. Special shock load absorber reduces spillage and alleviates damage to the hydraulics in rough terrain.

Consider all these, plus 60.3 h. p., power steering, torque converter, five-speed transmission, and left and right turning brakes. You can see why it will out-cycle machines with more capacity.

**CONVERTS INTO EIGHT DIFFERENT MACHINES** The Work Bull 1001 is easily changed from a  $\frac{3}{4}$  cubic yard Loader to a Backhoe (with its own backfill blade) ... to a Fork Lift ... Pick-up Sweeper ... Crane ... Angle Dozer ... Rotary Broom ... and back to a Loader and Scarifier right in the field. Each performs so efficiently you will think it is intended for just that one purpose.

**LOW PACKAGE PRICE** The Work Bull 1001 is priced less than anything in its class. In fact, chances are the complete basic unit and all attachments will cost you less than you normally pay for one single-purpose machine.

**OTHER POWER MATCHED MASSEY-FERGUSON EQUIPMENT** include the Work Bull 202 (40 h. p.) with integrated Davis Loader-Backhoe, Work Bull 303 (54.5 h. p.) with 500 Loader and Backhoe, Work Bull Fork Lift, plus a multitude of integrated attachments for each.

For information on the complete Massey-Ferguson line ask for Brochure G-4. For specific information on the Work Bull 1001 ask for Brochure W-1. Write Massey-Ferguson Industrial Division, 1009 South West Street, Wichita 13N, Kansas.



Telescopic arms on the Work Bull 1001 permit low pivot points but mammoth reach.



The Work Bull 303 with 500 Loader is also a highly maneuverable power-matched shovel loader.



The Work Bull Fork Lift has 10 easily changed attachments. Block tines have side shift feature.



**MASSEY-FERGUSON  
INDUSTRIAL DIVISION**



## Induction motor maintenance

*continued from page 122*

ventilated motors, to allow heat to dissipate. Check built-in applications with the manufacturer's design engineers to be sure of adequate ventilation.

**Misapplication causes many motor failures.** In case of doubt, consult the motor manufacturer. Some of the more obvious types of misapplication involve ambient temperature. Standard motors are designed to operate in a maximum ambient temperature of 40 deg. C. (104 deg. F). This should not be exceeded unless the motor has been specially adapted for this use. Motors with Class B or Class H insulation are usually required for high ambient applications.

For proper loading, it is necessary that the motor rating and the requirements of the load be matched. A simple tong ammeter is excellent for ensuring that load current agrees with the value on the motor nameplate, but more versatile and accurate instruments are at times desirable. The nameplate of many 40-deg. C.-rise motors will indicate that they carry a service factor, which means that the motors can safely be overloaded by a stated percentage of rated load. In the range of loading thus allowed, the increase in operating current will vary directly with the increase in load.

There are a number of basic electrical designs of induction motors, each suited to a particular field of application by reason of its specific performance characteristics. As a guide to correct application, the general operating characteristics of each squirrel-cage NEMA design motor are shown in a reference chart together with their principal applications. Violation of these application rules can cause motor failures and should be avoided unless approval of the motor manufacturer has been obtained.

**Proper mechanical enclosure** for the application is also important. There are two broad enclosure classifications, open and totally enclosed; each is divided into more specific subclassifications. The most common error made with enclosures is to install open motors in locations that require the use of totally enclosed motors. While open motors are priced below enclosed motors and are adequate for many industrial and most commercial purposes, they do have limitations. Open motors should be used only where the air that passes through to cool them contains nothing that might be harmful to the interior. A certain amount of dust and dirt can be tolerated, providing the material is not conductive or severely abrasive or corrosive.

Although the squirrel-cage induction motor is rugged, proper care should be exercised for dismantling and subsequent reassembly. Read the manufacturer's instructions carefully before starting to dismantle it.

Take care that the rotor is not bumped or scraped against the end turns of the stator winding when it is being removed from or inserted in the stator. If the rotor weight is such that it is awkward to manage by hand, use a crane lift to handle it in or out.

On sleeve bearing motors, drain the oil reservoirs before dismantling. On ball bearing motors, protect the bearings of a dismantled motor from dirt, dust, and moisture, particularly if the bearings are of the open type. Avoid touching the bearings or other polished metal surface. Good housekeeping, cleanliness and care are just as important in the maintenance shops as on the production line, possibly more so when the vulnerable internal parts of the motor are exposed.

The combination of electricity and rotating parts in the electric motor requires strict adherence to common sense safety rules to avoid injury to personnel. Wear goggles when blowing out dirt; wear gloves when handling cleaning solvents; avoid prolonged exposure to toxic fumes; take care that flammable solvents are not ignited. These precautions are necessary not only to protect those who maintain the equipment, but also to protect those who operate it.

END

## Rising freight rates

*continued from page 77*

position of justifying its own existence. For this reason, the battle of the statistics can never be expected to reach any sort of conclusion. Mr. Jensen is aware of this, and—I'm sure—the ICC statisticians are, too. The two groups can continue to refute each other's figures indefinitely. Therefore, although the replies are directed at the ICC, the purpose of answering their countercharges is to convince other minds slightly more malleable.

—Most railroads have no thorough-going system of cost accounting and are setting their rates—and may continue to do so—on the basis of faulty ICC figures and a set of preconceived notions out of the past which are based more on fantasy than on fact. One of these notions is that sand and gravel is a loss item and should be priced off the railroads. Another is that short-haul traffic is, *per se*, unprofitable. This attitude was well reflected in a letter sent to the NSGA by E. J. Carr, vice president of the Illinois Central Railroad. Mr. Carr said, in part: "While we regret the diversion

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## Rising freight rates

*continued from page 125*

of sand and gravel traffic in certain instances from our railroad, we advised one of our state commissions that our costs have so far outstripped our revenues that we would prefer such of this traffic as will not stand these increases to be diverted to other forms of transportation so that we may devote our facilities and energies to that which will pay its way." Mr. Carr might have said the same thing in four words: "We don't want you."

—Finally, many sand and gravel operators have been taking this kicking around from the railroads with hardly a protest. Pressures that could have been brought to bear haven't been; the efforts of a relatively few rugged and dedicated men have had to front for the entire industry.

Now, let's examine the positive side; there are two decided chinks in the armor of the ICC case for higher sand and gravel freight rates. If both of them are exploited fully, there's a chance of considerably brighter prospects for rail shippers of sand and gravel. These two openings are:

**1. The state public service commissions.** By the very nature of our system of government, the state commissions are often resentful of the heavy hand of the ICC. They are also closer to home, closer to the producer and his problems, and oftentimes a great deal more understanding. Several notable victories have been scored through state commissions against freight increases requested by carriers. Several years ago, when the railroads appealed to the Mississippi Public Service Commission to put into effect in that state the same increase authorized by the ICC in interstate rates, Mississippi sand and gravel producers, led by J. D. Lewis of the American Sand and Gravel Co., opposed the proposal before the state commissioners. When the commission refused to grant the increase in Mississippi, the ICC—petitioned by the carriers—ordered the commission to put the increase into effect. The order was declined, and the ICC appealed to the federal courts to force the Mississippi commission into line; but a three-man District Court denied the petition, and this decision was later upheld by the Supreme Court of the United States when it granted a "motion to affirm" the District Court ruling filed by attorneys Charles Horsky and R. W. Heidelberg, Jr.

Ellis Jensen won a similar case in Wisconsin, where the Public Service Commission denied a rate increase on sand and gravel in intrastate traffic after Jensen plead a good case for the industry. Similar actions might profitably be taken in many other states. No state body likes to be dictated to by a federal bureaucracy. If sand

and gravel producers can offer a well documented argument against intrastate rate increases, they are almost certain of a sympathetic hearing by the Public Service Commission in their own state. If the state commission is then forced by the ICC through the courts to raise rates anyway, the sand and gravel producer has added a strong ally in his battle against the ICC.

**2. The individual rail carriers.** In some instances, the railroads requesting the rates are actually more open-minded about taking another look at the problem than are the federal regulatory bodies. The railroads are responsible to their stockholders to operate at a profit. If sand and gravel producers can show them—as Ellis Jensen is endeavoring to do—that they can handle rock products profitably at lower rates, they may listen to reason. Not will, but *may*. Some are so completely indoctrinated in archaic methods and customs and truisms that they are almost beyond the point of redemption; but enlightened management is showing up on some of the rail lines, ready to listen and have a try at some new ideas.

Recently Jensen called the chairmen of the boards of two railroads servicing his marketing area and asked them if they would throw out all old, preconceived notions about sand and gravel, discard the traditional ICC figures, and make a fresh, new local study based on existing conditions in particular localities. Each of them agreed to give him a full day with one of their best accountants, and he made considerable progress in demonstrating to them that they should take a new, hard and detailed look at sand and gravel customers. As a result, both lines are now making a detailed study of this traffic. And Jensen is confident that it can't turn out any way but good for the rock products producers in Wisconsin.

Mr. Jensen and the associations serving the rock products field are now providing individual producers with all sorts of potent information in this battle against rail rate discrimination. If even a small percentage of individual producers and local organizations were to throw down the gauntlet and use this ammunition to fire at the carriers with whom they do business and their state public service commissions, a lot might be done.

As Mr. Jensen pointed out in his argument before the Wisconsin Commission: "It is most unpleasant to be at the mercy of the attitudes of the carriers as to whether we live or die, especially in view of the fact that they have never made any kind of showing that to let us live is to move our goods without profit to themselves. It is precisely at this point that producers such as ourselves must rely on the wisdom and sense of justice inherent in our public service commissions. We must ask

*Please turn to page 128*



Lima Austin-Western 61-E portable diesel-electric plant equipped with 10" x 24" Roller Bearing Jaw Crusher and 2' x 6' double deck Gyrating Screen. A complete single-pass crushing and screening unit that can move in and out of a job in a minimum of time.

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Portable plants are designed for fast moves and easy setups. Weight is distributed to meet most state highway limitations. One-man operation reduces the cost per ton. Their wide range of adjustment makes it simple to meet rigid specifications.

The Lima Austin-Western line includes jaw and roll crushers in many sizes, plus matching screens, elevators, conveyors and bins. Call on your nearest distributor for full information. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



Lima Austin-Western stationary crushing plant producing washed sand and three sizes of specification material.



Lima Austin-Western 101-S closed circuit portable crushing and screening plant; a high-output unit delivering sand and roadbase material in two sizes.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

**LIMA AUSTIN-WESTERN** Crushing, Screening and Washing Equipment  
**BALDWIN · LIMA · HAMILTON**  
 CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO





## Rising freight rates

*continued from page 126*

the commissions to protect us from dissolution if the carriers decide they don't want to bother themselves with our business."

As long as it's possible for one train to move over frictionless rails the equivalent of 250 to 400 truckloads of sand and gravel, and do it with a crew of five men plus a few clerical and maintenance people behind the scenes, it makes little sense to believe that such traffic is unprofitable to the railroads. There is excellent ammunition available, now, to prove that just the opposite is the case. As a matter of enlightened self-interest, rock products producers everywhere should at least fire a few tentative rounds in their own marketing area. It may wind up hitting a good many profitable targets.

"I'm just an amateur," says Ellis Jensen, "fighting for his business life. In real life, Galahads don't often slay the dragon. An upstart like me can't lick the whole ICC. But if our industry ever got together in attacking this problem all over the country, we could go far in improving the transportation side of our marketing problems. And while thus helping ourselves, we would also be helping the railroads who are so badly in need of more traffic."

END

## Hard shell aggregate

*continued from page 81*

veyors are loaded through chutes with manually operated regulating gates. The reclaim belts discharge either to an inclined belt conveyor loading a 125-ton, rail-loading hopper, or to a belt conveyor under the railroad tracks leading to the barge-loading belt. The barge-loading belt can be raised or lowered to help trim barges as they are filled with Materialite. The rail-loading bin is available to make truck shipments to local markets if needed.

All oversize from the top deck of the vibrating screens is discarded to be used as fill. However, if a crushed lightweight aggregate is ever needed, a cone crusher and a belt conveyor recycling system back to the vibrating screens is available to process oversize. For the time being, because of the superior characteristics of the finished round pellets, Material Service Corp. prefers to concentrate on developing markets for this product.

Production of Materialite is constantly checked during processing to make sure that quality is being maintained. In addition, samples of each shipment are taken to determine that the size

distribution of the materials is within company standards. The operation of the plant is under the supervision of David Lewis, plant manager, who is experienced in processing shales to make lightweight aggregates. He is directing the continuing study of manufacturing methods, and will be assisted by Doug Kirp, plant superintendent. The construction and first operation of the plant was supervised by William Moyle, Material Service's assistant production manager.

New markets for the product must be developed and maintained in the highly competitive industrial areas around Chicago to assure continuous peak capacity operation of the new plant. George Kirp, vice president and general production manager of Material Service, and Charles Goodman, product manager for Materialite, are directing the investigations of markets and applications.

END

## Lime in Australia

*continued from page 102*

tion is never passed on to the struggling commercial producer. There are justified chemical secrets, of course, but not in the field of lime and to withhold these is to the detriment of common good, especially in countries like Australia where the need for this information is so great.

I had quite an inspiring interview with Sir Thomas Playford, Premier of South Australia. It seemed that no one appreciated more the importance of building a modern plant for economical production of such a basic product as lime than did Sir Thomas.

It was Sir Thomas Playford who established the rather splendid Research and Development Laboratories of the South Australian Department of Mines. This is an impressive organization of buildings, departments and scientific crews operated under T. A. Barnes, Director in Dept. of Mines and T. W. Dalwood, Chief Superintendent.

I had several conferences with these gentlemen and many contacts with their staff. All were extremely helpful and even eager to put their splendidly equipped laboratories to work in lime research.

Their knowledge of lime, in general, is very good but they realize that they do not know it in detail. It is the innumerable little details that come from plant experience and laboratory research that help further the lime industry. Therefore, scientific research in Australia is more than just desirable, it is imperative!

A program was suggested which included:

1. The building of a Pilot Lime Plant designed by Azbe Corporation for Armour Research Found-

*Please turn to page 136*



# CONTINUOUS RESEARCH AT CATERPILLAR LABORATORIES IS EXTENDING ENGINE LIFE THOUSANDS OF HOURS

**EXAMPLE:** Lube oil filter elements that give greater protection  
for longer periods at less cost

The development of new, additive lubricating oils has reduced oil change requirements. Cat filters have kept pace with these improvements. Cat filters have greater *dirt-holding capacity* to filter efficiently over the entire *extended* periods. This means a big saving to every owner of Caterpillar equipment.



**FILTER TEST STAND** adds controlled amounts of dirt to lube oil to check how much dirt an element can hold before plugging. Unless this is determined, replacement recommendations cannot be made. Of all the filter makes tested, only Cat filters completely met Cat Engine requirements.

Most oil filters of other makes fall far short of meeting Cat filter replacement recommendations—usually because they have *insufficient* dirt-holding capacity (not enough filtering paper) or they filter harmless, too-fine particles which quickly load up the element, opening the safety bypass. As a result, unfiltered oil is allowed to circulate, causing rapid, premature wear.

You can't get maximum engine life unless you filter *full time*. The best way to insure long engine life, peak performance and operating economy is to standardize on Caterpillar oil filters. They are the only filters you can count on to give full-time protection over the entire filter change period that is recommended for your Caterpillar Engine. See your nearby Caterpillar Dealer today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



**PROJECTION MICROSCOPE** magnifies 500 times particles that pass through filter paper so they can be measured. Since precision bearings ride on an oil film, particles smaller than the oil film can cause no measurable wear even after thousands of operating hours. Too-fine filtering shortens filter life needlessly.

## CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

## This contractor saved \$1,822.24 in one year in oil changes

### SERVICE TIP

Complete information on oil changes is provided in Form 32421-1, *Crankcase Lubricating Oil Change Period Recommendations*, available from your Caterpillar Dealer. These recommendations are tested and proven. When used with Cat filter elements, you'll get maximum protection for your equipment at the lowest cost.

Many Caterpillar owners tend to play it safe by changing lube oil and filter elements far more frequently than recommended; thus they are willing to gamble on lower-priced, small-capacity

filter elements. This is false economy. Here is an actual experience of a contractor, owner of eight Caterpillar D8 Tractors, who followed recommended procedure with Cat filters:

Past Procedure — Oil changed every 80 hours	
Lube oil @ \$1.25 per gal.	
9 gal. per change . . . . .	\$11.25
filters @ \$1.00 ea.	
3 per oil change . . . . .	3.00
Labor cost . . . . .	2.50
<b>Total cost per change</b> . . . . .	<b>\$16.75</b>
. . . . .	
Ave. operating hours per year . . . . .	2,400
Ave. oil changes per year . . . . .	30
Total cost per machine per year . . . . .	\$502.50
Total cost for eight D8s . . . . .	\$4,020.00

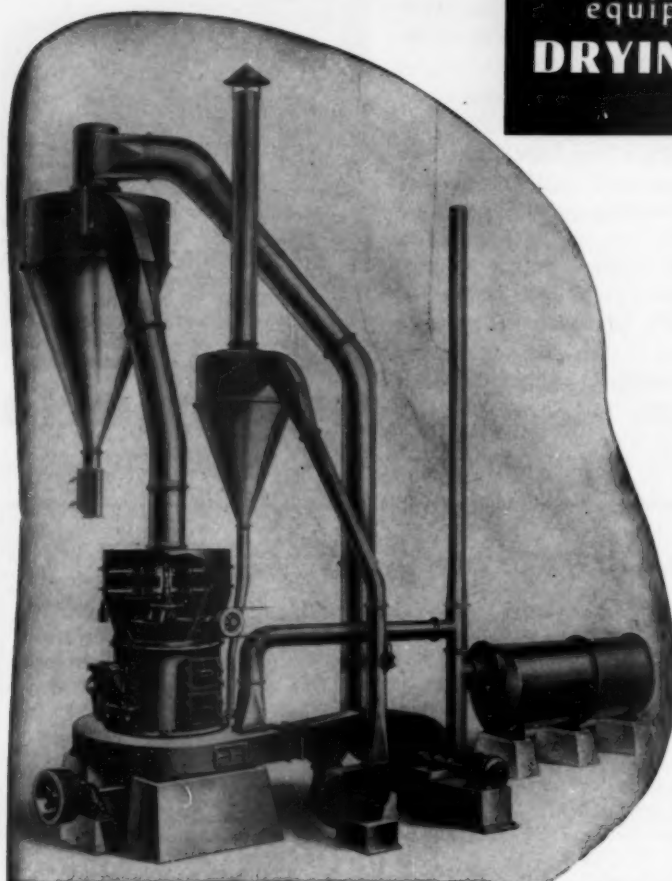
Cat Recommended Procedure — Oil changed every 150 hours	
Lube oil @ \$1.25 per gal.	
9 gal. per change . . . . .	\$11.25
Caterpillar filters @ \$1.14 ea.	
3 per oil change . . . . .	3.42
Labor cost . . . . .	2.50
<b>Total cost per change</b> . . . . .	<b>\$17.17</b>
. . . . .	
Ave. operating hours per year . . . . .	2,400
Ave. oil changes per year . . . . .	16
Total cost per machine per year . . . . .	\$274.72
Total cost for eight D8s . . . . .	\$2,197.76

D8s — 2U, 14A and 15A Series Tractors • Lubricating oil used: Series III • Fuel sulphur content: .4% to 1.0%

*Proven Economy* in Pulverizing

# LIMESTONE

**RAYMOND ROLLER MILL**  
equipped for  
**DRYING and GRINDING**  
... simultaneously



RAYMOND ROLLER MILL equipped with Flash Drying Accessories for removing moisture while grinding.

THE fine grinding of limestone is an ideal application for the Raymond Roller Mill.

It offers special advantages in producing the finer grades: suitable for agricultural purposes, mineral fillers, mine dust, chemical processing, as well as many special uses.

1. The Roller Mill with Whizzer Separator has easy fineness control over a wide range up to 99.9% passing 325 mesh or better, and instantly adjustable while operating.
2. By the use of Flash Drying accessories, the Mill can dry and grind the material in one operation . . . which is by far the most economical method.
3. Units available in several sizes to provide wide range capacity up to 30 tons or more per hour for Super Roller Mills.
4. Automatic dust-free operation . . . minimum power and lubricating costs . . . low maintenance with long service . . . all help to make the Raymond Roller Mill a traditionally low-cost producer.

Write for Roller Mill Catalog No. 79. Tell us your requirements . . . and Raymond engineers will advise the type of equipment needed.

**COMBUSTION ENGINEERING, INC.**  
*Raymond Division*

1307 NORTH BRANCH ST.  
CHICAGO 22, ILLINOIS

Combustion Engineering-Superheater Ltd., Montreal, Canada

SALES OFFICES IN  
PRINCIPAL CITIES

Enter 1521 on Reader Card

## ROCKY'S NOTES

(Continued from page 21)

there is only a small percentage of  $^{18}\text{O}$  in air and water. The conclusion we may draw from these data is that there can apparently be combinations of two kinds of carbon with three kinds of oxygen, which if our recollection of mathematics is sound, means we may have at least six different variations of carbon dioxide ( $\text{CO}_2$ ).

Our isotope geochemistry becomes even more complicated when we come to consider calcium, for there are six stable isotopes of this element, the common  $^{40}\text{Ca}$ , and  $^{42}\text{Ca}$ ,  $^{43}\text{Ca}$ ,  $^{44}\text{Ca}$ ,  $^{46}\text{Ca}$  and  $^{48}\text{Ca}$ . Thus there is a difference in atomic weights, in the extreme case, of 8. Nearly 97 percent of the calcium in nature is  $^{40}\text{Ca}$ , but there is over two percent of  $^{44}\text{Ca}$ . The others are quite rare. However,  $^{43}\text{Ca}$  and  $^{44}\text{Ca}$  together may constitute 2.7 percent of a calcium oxide ( $\text{CaO}$ ), which means, of course, that the so-called "heavy calcium" can be found in most limestones, or calcite, quite possibly concentrated in some localities. Since it is now believed that solution and redeposit of calcium carbonate may play a part in the concentration of heavy calcium, it seems entirely possible that calcites under different conditions of formation may vary considerably from the average  $^{40}\text{Ca}$  content.

We will leave it to someone with a better working knowledge of mathematics to figure out how many permutations and combinations are possible with two carbons, three oxygens and six calciums, but we know, or remember enough, to realize that the number will be considerable. All this is not intended to bolster Mr. Daniels' claims for Aktivitt cement blend or concrete, but rather to show that present knowledge of isotopes or nuclear chemistry is yet so incomplete, that it is possible for both Mr. Daniels and the experimenters who reported to the American Concrete Institute to be right. In the same way vagaries in lime and portland cement may some day be explained rather than speculated about, as they must be at present. Such differences do exist with no present satisfactory chemical explanation.

Our own very limited experience leads us to believe that pulverized limestone mixed with cement does have some virtue at least as a stucco cement. We have had a very intimate acquaintance with a cement stuccoed frame house. The stucco was badly cracked and unsightly. A firm in a Chicago suburb, which specializes in

such work, was recommended to us some 20 or more years ago. This outfit went over the old stucco with a very wet mix of cement and limestone screenings (dolomite apparently) from about  $\frac{1}{4}$  in. down, including all the clean dust. The new coat was slapped on by a large crew of workmen in a single working day. It is there yet without a single crack showing.

The only explanation we can think of is that such a stucco coating undergoes continuous autogenous healing or sealing—we believe that is the term that was once used, but we don't find any reference to it in the newer textbooks on cement and concrete. It

means in this case that the calcium carbonate is continuously dissolving on the surfaces exposed to weathering and being redeposited in the cracks, keeping them sealed. We presume that present-day masonry or mortar cements made of blends of portland cement and pulverized limestone will do the same. However, straight portland cement stucco, from our observation, is nowhere near as popular now as it was 30 or 40 years ago, probably because of bad examples such as we have mentioned.

It is universally acknowledged now that no concrete aggregate is "inert."

(Continued on following page)



## Proof of Performance

The kiln illustrated is equipped with the Type F Recuperator. It presents conclusive proof of claims made for Recuperator performance, namely, rapid air quenching and cooling with immediate ignition of the fuel-air mixture at the tip of the burner pipe. It will also be observed that visibility inside the kiln is exceptional.

**MANITOWOC SHIPBUILDING INC.**

**MANITOWOC, WIS.**

## ROCKY'S NOTES

(Continued from preceding page)

There is every reason to believe that limestone, or calcite, does react with some of the constituents of hydrated portland cement. It is well known, of course, that some sodium silicate solutions react rather rapidly with finely divided calcium carbonate, to form calcium silicates, or insoluble mixtures of sodium and calcium silicates. Powers, in his PCA research on cement-alkali-aggregate reaction has offered an explanation that unfavorable results may be prevented by having

enough calcium hydroxide readily available in the locale where reaction is taking place. Apparently calcium carbonate is as readily reacted upon by alkalis as is calcium hydroxide. Moreover, when solution and reaction with calcium carbonate takes place  $\text{CO}_2$ , or the radical  $\text{CO}_2$ , is released.

The free  $\text{CO}_2$  can of itself cause various reactions, such for example as combination with the sodium of the silicate formed in the alkali-aggregate reaction, resulting in the formation of sodium bicarbonate, which is very soluble and hence could either be released from the concrete in weathering, or readily dispersed

through the mass of concrete and thus rendered harmless, or perhaps make Ca or CaO more easily available for the kind of a reaction suggested by Powers. All in all, we merely wish to emphasize that the problems of chemistry involved in the making of cement and concrete are very far from being solved.

END

## Tractor maintenance ideas

**T**O ASSURE MAXIMUM EFFICIENCY and continued operation of your tractor follow the lubrication and maintenance rules listed.

### Packed positive seal assemblies

1. Before your new tractor is put to work, inspect these assemblies to determine if they are filled. Remove the shaft plug and insert a clean wire or screw driver into the shaft hole. If grease is evident, replace the plug without adding grease, otherwise fill the assembly with the approved grease.

2. Lubricate the assemblies every 10,000 hours of operation with the lubrication equipment furnished with the tractor. See your nearest authorized dealer for information in regard to greases which are satisfactory for use in truck wheels, support rollers and track idlers. Clean the end of the shaft and plug before removing the plug. Be sure the nozzle and lubrication equipment is absolutely clean. Pump new grease in slowly until clean grease can be seen coming out along the outside of the nozzle. It is not necessary to flush out all the old grease provided it is clean.

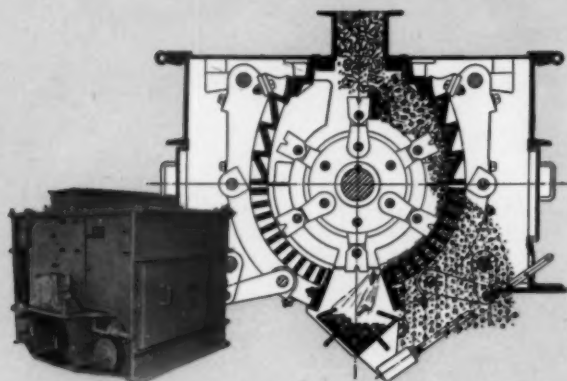
3. At least every 1,000 hours and more frequently in extremely severe operating conditions, inspect the assemblies for end play, and up-and-down motion. Loose, damaged or badly worn assemblies should be removed and repaired before complete failure can occur.

Do not lubricate the grease packed positive seal assemblies daily or weekly. Do not allow any dirt to enter the assembly while lubricating, either from dirty grease, dirty lubrication equipment or dirt on the end of the shaft. Do not use a grease fitting in the shafts, or in a power lubricating system. Do use the nozzle assembly furnished. Pump grease in slowly. Do clean all parts thoroughly and use clean grease.

You can save time and money by following these instructions. Remember, in every case, clean lubricant is of the utmost importance.

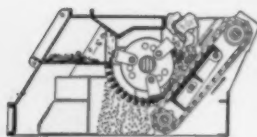
taken from the Allis-Chalmers Reporter

## REVERSIBLE, ONE-WAY OR NON-CLOG



Pennsylvania Reversible Hammermill

Whatever type of crusher is best for your job, Pennsylvania has it. If it's a hammermill that seems to fit, Pennsylvania makes Reversible and Non-Reversible types for secondary or tertiary crushing where high capacity with low power demand is wanted and a coarse or medium fine product is desired without using a closed circuit system. For crushing wet and sticky feeds, the Non-Clog practically eliminates any trouble from feeds choking up and slowing down production. The continuous travel of the breaker plate forces the feed into the path of the hammers making it impossible for material to build up out of reach of the hammers. Send for bulletins.



Non-Clog Hammermill

Pennsylvania Crusher Division  
Bath Iron Works Corporation  
West Chester, Penna.

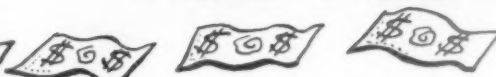
**PENNSYLVANIA  
HAMMERMILLS**

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Company Address \_\_\_\_\_ City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

MAIN PRODUCT OF PLANT \_\_\_\_\_ CAPACITY \_\_\_\_\_

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0.5 seconds



1.0 seconds



1.5 seconds

The little puff of smoke in the foreground is a signal bomb for the photographer



2.0 seconds



3.5 seconds



7.0 seconds

## 2,750,000 pounds of Du Pont "Nitramex"® 2H Removes Ripple Rock

**Why it was chosen for this biggest of all blasts...**

**For Its Safety**—The inherent safety of blasting agents helped win the nod for "Nitramex" 2H over conventional dynamites for a complex coyote blast of this sort.

**For Handling Convenience and Water Resistance**—Packed in hermetically sealed metal containers easily carried and stacked, and producing no headache from handling, "Nitramex" 2H was a natural.

**For Strength**—Plenty of energy was needed to knock off two underwater peaks, and "Nitramex" 2H supplies power equal to 80% Gelatin, higher than any other blasting agent.

**For High Density**—The blast required extremely heavy charges. "Nitramex" 2H, with the highest density of any commercial explosive, insured getting the required loads where they were needed regardless of size of coyote.

**For Shattering Power**—The high velocity and power of "Nitramex" 2H was needed to insure adequate

breakage and dispersal of rock in order to provide required channel depth without dredging.

Your Du Pont Explosives representative can show you a Du Pont Blasting Agent that can improve your blasting. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

### DU PONT BLASTING AGENTS



*Blasting Supplies and Accessories*

Better Things for Better Living . . . through Chemistry

## Lime in Australia

*continued from page 128*

dation which would enable practical lime men to study the actions of various limestones under simulated conditions of commercial production.

2. The study of exothermic reaction of limestone under heat. The extent of the reaction, the precise nature of the reaction and identification of the compounds created.

3. Study of the nature of silica in limestone. During calcination some silicas combine and some do not. Swan Portland Cement Co. of Perth produces a fairly good hydrate from stone having 23 percent silica.

4. Study of the nature and reactivity of insolubles in lime and effect of time and temperature.

5. Reasons and mitigation of discoloration of lime. Effect of reducing and oxidizing atmosphere.

6. Nature and activity of sulphur in stone or in fuel.

7. Value of lime on a differing basis. For chemical purposes and for building purposes.

I am quite certain that the Honorable Sir Thomas Playford, who established the Australian research laboratories would be immensely pleased and proud if this institution, while serving Australia, would also help many other countries.

It will come about. A close contact with our National Lime Association has already been established and Mr. Evans will not rest until there is an Australian lime association. He has the energy, the vision and all of the other abilities that are necessary to make it a success. Support from Western Australia has already been promised.

END

## The ACL system

*continued from page 85*

should be given to the adaptability of raw materials to pelletizing. Pellet strength and abrasion resistance in their preheated condition should be determined. Materials lacking a component which will impart these qualities to the pellets will require a higher grate speed and lower grate bed depth than normal. This is due to the carry back of excess dust generated in the kiln, onto the grate bed in the preheating chamber. If the grate speed is slow the kiln draft will be reduced by the dust buildup on the bed.

All air infiltration must be eliminated. All surfaces over which the exhaust gases pass must be insulated. This is required by the low exhaust temperature, close to the dew point, at which conden-

sation containing compounds corrosive to ordinary steel surfaces occurs.

Where suitable raw materials are available, the ACL system is ideal. It will undoubtedly do much to enable cement producers to locate new plants in metropolitan areas closer to industrial customers.

END

## Electrostatic precipitators

*continued from page 110*

volume and resistivity conditions improved. Build-up problems can be brought within bounds by this form of temperature adjustment.

Water addition at the kiln end housing or in special chambers immediately behind the kiln end housings has now been accepted in principle by most of our large cement manufacturers. The problems in design are peculiar to each plant and the results have been most gratifying.

The ACL kiln system and other wet nodulizing kiln systems ordinarily produce gases well conditioned with water and in good operating ranges from a resistivity standpoint. While excessive dilution or overly dry gases can rapidly change this picture, the principal problems appears to be those associated with dust handling, hopper evacuation, and insulation.

The Fuller-Humboldt preheat and other similar systems are presenting new problems to the field. It appears that the final gas temperature at the collector is at the peak of the resistivity curve and is combined with a low moisture content and a very fine dust. We would predict great collection difficulty in a precipitator, requiring either water conditioning or excessively large precipitators. We feel that the optimum design for these systems has not been developed and existing installations are being studied with great interest.

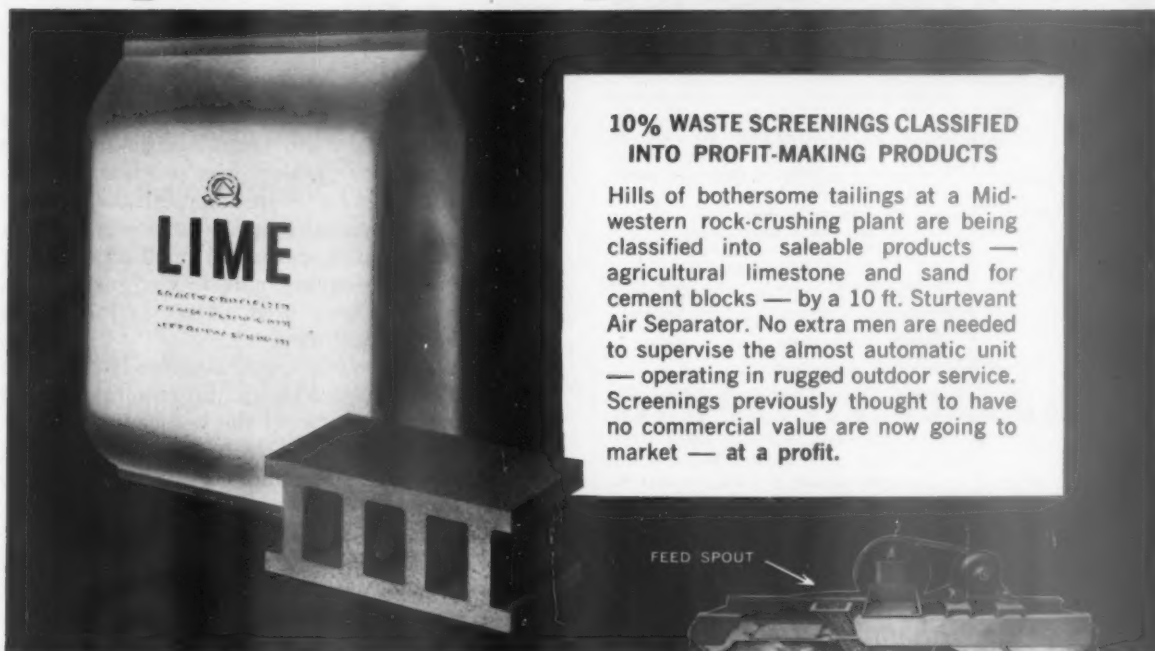
The fundamental principles of the electrostatic precipitation process and the problems in the operation of these precipitators were encountered in the first commercial high temperature precipitator at the Riverside Cement Company's Crestmore plant from 1910 to 1912. Since that time the development of the electrostatic precipitator and of the cement industry has progressed together. Now electrostatic precipitators are used on the dust laden exhaust from kilns, dryers, mills, and coal handling equipment.

While many dust and fume problems are bound to arise as bulk mineral matter is quarried, crushed, ground, transported, calcined, reground, sacked and delivered, most of these problems are more advantageously handled by mechanical collectors and baghouses. Only the more important

*Please turn to page 138*



# Tailings Go to Market - Separated by Sturtevant



## 10% WASTE SCREENINGS CLASSIFIED INTO PROFIT-MAKING PRODUCTS

Hills of bothersome tailings at a Mid-western rock-crushing plant are being classified into saleable products — agricultural limestone and sand for cement blocks — by a 10 ft. Sturtevant Air Separator. No extra men are needed to supervise the almost automatic unit — operating in rugged outdoor service. Screenings previously thought to have no commercial value are now going to market — at a profit.

## THE SEPARATOR THAT UPPED 40 TO 400 MESH OUTPUT AS MUCH AS 300%

Sturtevant Air Separators range from 3 to 18 ft. in diameter: deliver fines from 40 to 400 mesh at rates as high as 65 tons per hour . . . in the cement industry, have a tested record of increasing mill capacities from 25 to 300% while lowering power consumption as much as 50% — when used in closed circuit with grinding mills.

Designed to cut costs and build profits, Sturtevant Air Separators give a lifetime of high-efficiency, low down-time service. Rugged construction plus easy accessibility for quick maintenance (typified by the "Open-Door" design in other Sturtevant equipment) assure more output per machine year.

Write today describing your problem. Please include information on material, process and desired capacity.

Address: Sturtevant Mill Company,  
102 Clayton St., Boston 22, Mass.

## STURTEVANT Dry Processing Equipment

The "OPEN-DOOR" to lower operating costs over more years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS  
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS



### What Can a Sturtevant Air Separator Do in Your Pulverizer System?

Controlled centrifugal whirl by balancing forces separates rapidly, efficiently, cement, lime, clay, talc, ceramics, refractories, phosphates, coal and many other materials. Also used for selection of pigments, limestone, fillers, plastics, oyster shells and abrasives. Write for Sturtevant Bulletin No. 087.



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The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

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centrifugal PUMPS

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In a Hayward, there's no contact between the closing mechanism and the material handled. This means much less wear, reduced upkeep, big savings in bucket maintenance. THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

### HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES  
famous for performance since 1888

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## Electrostatic precipitators

continued from page 136

ones in magnitude need to be handled by electrostatic precipitation.

**New applications.** One recently developed important application for precipitators is cleanup of the air from modern air-swept raw and finish grinding mills. For many years the back-discharge or dust resistivity problem was so great that installations of this sort were impractical. The difficulties were compounded by the small gas volumes to be handled which resulted in small collectors at a relatively high cost per cubic foot of gas treated. Bag filters have been used almost exclusively in North America until recently.

The newest practice involving relatively large finish mills and introducing water spray cooling into the mills has brought the problem within the economic province of the electrostatic precipitator. Low power and maintenance costs, inherent in the precipitator, now swing the balance in its favor.

The main problems are moisture control to avoid resistivity troubles and the ability to withstand peak shock dust loadings without the precipitator operations being adversely affected. The plant operator strives to achieve good mill operation with uniformity of feed, gas flow, and moisture; all of these are required by the precipitator for optimum performance. Automatic controls on the energizing equipment are indicated to handle disturbed conditions without requiring the mill operator to pay attention to the precipitator when he is trying to restore balance to his mill system.

Another application is on rock and shale dryers. A number of these dryers are operated in conjunction with kilns and often the effluents are combined before treatment in the precipitator. The problems encountered in this type of operation will be common to those discussed under kiln gas treatment in general. Where independent dryers are used, mechanical collectors are sufficient in most instances; however, where real plant clean-up is required, the precipitator can be designed to give any desired stack effluent. The materials from these dryers are easily collectible and the high moisture content produces a well conditioned dust. The main problems are generally caused by feed fluctuations in moisture content which cause varying electrical conditions within the precipitator; and by the corrosive agents present, moisture from the rock, and sulfur from the fuels. We have had excellent results in this service by the use of copper bearing steels for main members, shell, and

Please turn to page 140

Users who purchased the PAYLOADER tractor-shovels shown in this ten-mile-long motor caravan exhibited an ever increasing PREFERENCE for HOUGH equipment. These customers tell us their preference is based on PROVEN PERFORMANCE instead of claims; DEPENDABILITY rather than speculation and on our years of EXPERIENCE which total more than all others.

Almost every MAJOR IMPROVEMENT in the rubber-tired tractor-shovel field has been PIONEERED and developed by The Frank G. Hough Co. Add to this, unsurpassed PARTS and SERVICE facilities offered by 211 distributor outlets and you have the reason for PAYLOADER PREFERENCE.

Many exclusive attachments like the Superior Hydraulic SIDEBOOM, Wain-Roy BACKHOE, patented Drott "4-in-1" Bucket, Ram BLACKTOP SPREADER and other devices make PAYLOADER tractor-shovels more versatile than others. Get your free copy of the booklet "HANDLES EVERYTHING."

7-8-1



Modern Materials Handling Equipment

**THE FRANK G. HOUGH CO.**

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SINCE 1885—GRUENDLER QUALITY, THE BEST THAT MONEY CAN BUY



**150 TO 200 TONS PER HOUR CAPACITY  
STATIONARY PLANT, CRUSHING AND  
SCREENING GRANITE FORMATION ROCK  
IN THE STATE OF GEORGIA**

The Gruendler Jaw Crusher is fed by a ruggedly built feeder and the delivery conveyor directs the crushed rock to a gradation screen situated over the storage bin. In addition to Gruendler Equipment, a cone crusher reduces the oversize rock to the return conveyor and then to the delivery conveyor, completing a continuous circuit.

It's the rugged stability built into Gruendler Crushing, Screening and Material Handling Equipment that counts.

Write for Bulletin on **ROCK and GRAVEL OPERATION**  
Manufacturers of Rock and Gravel Crushers, Pulverizers, Screens & Conveyors

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INCLUDING URANIUM & LIMESTONE — ANYWHERE

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**GROUT HOLE DRILLING**

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THE  
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MINERALS INDUSTRY

## Electrostatic precipitators

*continued from page 138*

hoppers, of aluminum for collecting electrodes, and of copper for discharge electrodes.

The developments underway in the laboratory and the constant quest for new and better materials and methods by the manufacturers' engineering and development groups portend many new advances for electrostatic precipitation.

END

## Air in asbestos mill

*continued from page 89*

six mills—huge drums rotating about a horizontal axis. Impact crushing in these drums is accomplished by lifting and dropping the ore, a process aided by special rail lifters mounted on the inner circumference of the drum. Natural crushing action is supplemented by 6-in. steel balls intermixed with the ore.

Drum rotation, feed, impact crushing and discharge from the mills is continuous. Ore reduction continues until the rock is reduced to a size which can be drawn out by the fan-controlled stream.

After passing through baffle separators and cyclone collectors for separation from the conveying air, the fiber-rock mixture goes to gyrating screens.

At the end of every screen a vacuum hood, marking the start of the open vacuum circuit, sucks up fiber from rock. From 1.2 to 4.0 in. of static pressure passes through each hood. Heavy material falls from the screen to a conveyor belt which carries it to be reprocessed.

The dust content which the fiber has acquired in the crushing and milling process is now removed. From the vacuum hoods the fiber travels to cyclone collectors where fiber is precipitated and dust is swept upward to the top floor of the mill. The heavier fiber which remains in the collectors is continuously discharged for further screening, grading and classification.

The air circuit provided by the fans forces the dust through filter tubes which separate dust from air. The tubes empty at intervals by means of an automatic shaking system. Mixtures of dust and fiber are returned for further treatment, and the process is repeated until the dust is completely removed.

Dust is also removed at every stage of the milling process, by this or other air circuits. Where one conveyor belt discharges onto another, suction hoods lift the dust up to the four units of fabric filters and the plenum chambers.

END



# "MARCY kept us in business"

*says George Wagner, Superintendent*

**DENVER MORTAR AND MATERIALS COMPANY**

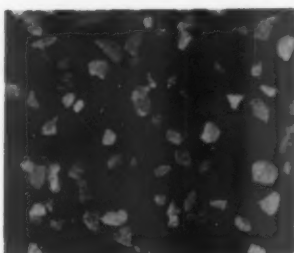


**now gets \$2.00 a yard out of waste gravel**

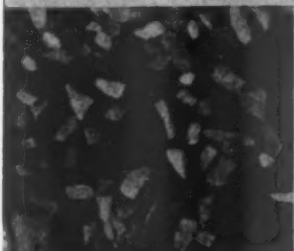
About 6 years ago the company management thought they would have to go out of business. The sand deposit was running over 50% pea gravel for which there was a very limited market ...and they were lucky to get 25c a yard for it. This condition also presented a serious stockpiling problem.

Then they bought a 3' x 6' Marcy Rod Mill. Screening at 6 mesh results in approximately equal quantities of plus and minus 6-mesh products. One pass through the rod mill reduces the pea gravel to the desired size for plaster and masonry sand.

George Wagner, Superintendent, says: "The Marcy Mill makes a better product, cleaner and sharper than the natural sand. Now we get \$2.00 a yard, wholesale, instead of nothing, out of half of our pit material. The Marcy mill kept us in business."



MARCY CPD MILL PRODUCT



CRUSHER PRODUCT

## COMPARISON OF MARCY MILL AND CRUSHER PRODUCTS

Identical rock samples were put through a crusher and a Marcy CPD Mill. The resulting products, screened to -10 +14 mesh, are shown above. Note the elongated shape and sharp, weak edges of the crushed product compared with the uniformly cubical Marcy Mill product.

For complete information on the many advantages of grinding sand with Marcy Rod Mills—

**The  
Mine & Smelter  
Supply Co.**

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**SPECIALISTS IN GRINDING FOR FORTY YEARS**

## Bucket drill

*continued from page 88*

While the conclusions from the study are not all final, several facts seem to be clear. There is no question about the adequacy of supply. The aggregate plant in final form will emphasize high screening capacity, and probably high washing capacity—using water from the Colorado River far below—to remove decantable materials and ground salts which surround the formation. The optimum plant location has been established, representing the correct balance between mid-point of aggregate deposit and the minimum transportation distance to the dam. Heavy media separation to remove deleterious aggregate is a certainty. Certain, too, is a general deficiency in No. 30 sand fines; considerable blending will have to be done to get proper sand gradation.

Glen Canyon Dam, a 5,500,000-cu. yd. concrete barrier, is being built under the jurisdiction of L. F. Wylie, Project Construction Engineer, U. S. Bureau of Reclamation. Operations of Merritt-Chapman & Scott Corporation are under the overall supervision of William Denny, Executive Vice President in charge of the company's construction department. A. R. Bacon is Project Manager and A. H. Griffin is Project Engineer. As concrete en-

gineer, I supervised the aggregates exploration program, assisted by V. O. Stone, who was in charge of drilling operations.

END

## Stone plant meets twin needs

*continued from page 92*

screens passes to a pair of 100-ton surge bins, set individually opposite each set of screens. Trucks will haul material from these either to stockpile or to jobs where it is needed.

Trucks provide transportation from Jeffrey Stone Co. to local consumers. Out-of-town delivery has been handled by Cotton Belt Railroad, loaded from company trucks in North Little Rock.

The plant gets its water from a man-made lake. It is pumped to the washer and returns to the lake through a system of pipes, ditches and culverts. The lake, developed from a smaller natural one, presently averages 5 acres in area and contains about 25,000 acre-ft. of water. Half a million gallons are used in a normal working day.

W. D. Jeffrey is president of the Jeffrey Stone Co., Ray Tilley is vice president, Pete Fowler is secretary-treasurer and Burke M. Tolliver is sales manager. The crushing plant employs about 30 men, with Mack Shaver as plant manager.

END

## ROLLING STONE CAN'T DENT THIS PLATE!

### *It's made with Hendrick H. Quality Steel*

Hendrick H. Quality Perforated Plate is made from high carbon or stainless steels. High carbon can be heat-treated after perforating for a longer life. This tough steel was carefully developed by Hendrick, after many years of experience in selecting and specifying the best analyses of steel for the aggregates industry.

In addition, Hendrick H. Quality Perforated Plate assures uniformity in your product. Full clearance practically eliminates blinding. You get faster deck changes, for lowered labor costs.



The large, open area offers you maximum protection. Hendrick H. Quality Steel Perforated Plate is available either flat, corrugated or stepped, in any desired shape and with perforations of any size. Write to Hendrick today to find out more about this durable Perforated Plate.

## Hendrick

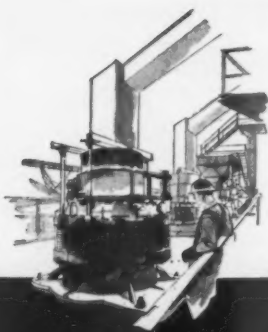
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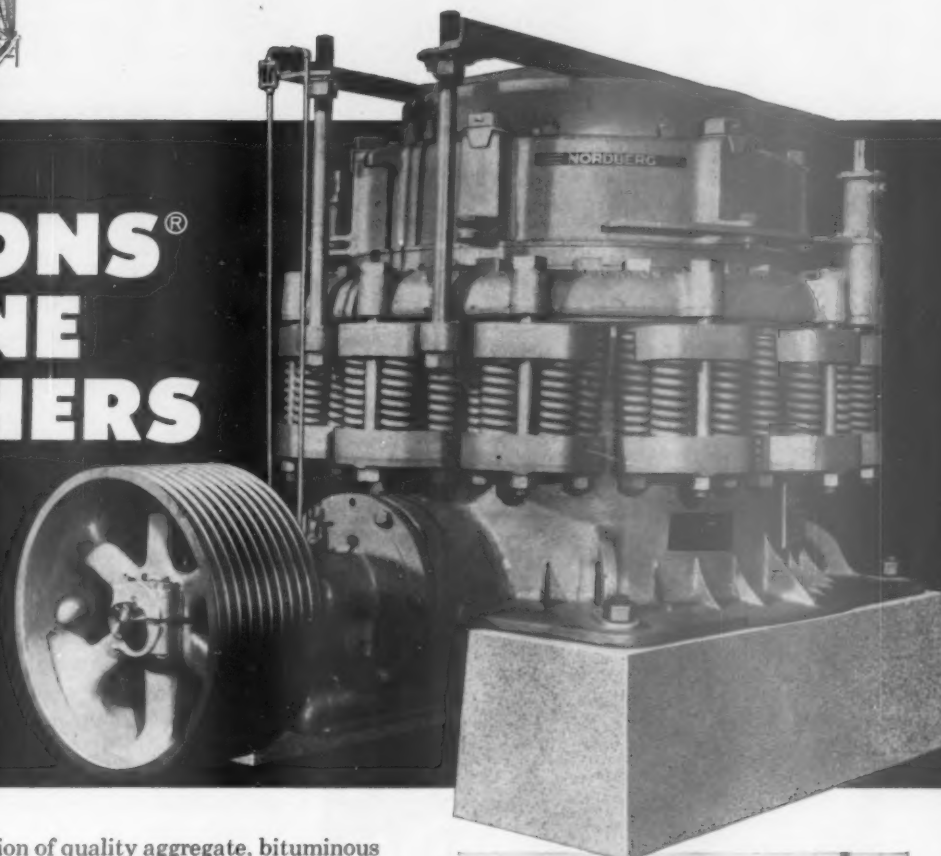
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**You get Quality Aggregate  
at lower cost with...**



# **SYMONS® CONE CRUSHERS**



For continuous production of quality aggregate, bituminous mixes and sand at lower cost—think first of Symons Cone Crushers—heavy duty, versatile crushers that produce more material to desired specifications, use less power, and give long service with low maintenance. Good reasons why these Nordberg built crushers are the outstanding choice of leading producers and contractors in the construction of highways, dams and hydro projects, bridges, as well as commercial and residential buildings.

Consult Nordberg soon . . . it will pay you to specify and use Symons Cone Crushers for both stationary and portable service. Write for descriptive data on Symons Cone Crushers—built in sizes to produce from 6 to 900 or more tons per hour.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

**NORDBERG**

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C-358



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SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • GENEVA • JOHANNESBURG • LONDON • MEXICO, D. F.



## **IN PORTABLE SERVICE**

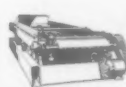
Increasing numbers of portable plant operators are now using Symons Cone Crushers for big capacity of fine product . . . such as the Cedarapids portable crushing plant utilizing a 4' Symons Cone Crusher, shown above.



**SYMONS  
GYRATORY  
CRUSHERS**



**SYMONS  
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GRIZZLIES**



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## NO CONCRETE PIT!

*Easiest to MOVE!*



### PORTABLE TRUCK SCALES

Engineered for rugged use in the field. Low initial cost, no maintenance. Can be used as PITLESS SCALE saves on pit costs.

CAPACITIES: 20 to 52 tons. DECK LENGTHS 18 to 43 ft.

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THE BLACK BROTHERS CO., INC., 503 9th Ave., Mendota, Illinois

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## Lime Association meets

*continued from page 120*

plication of lime to road building needs the same carefully engineered approach that is used for other construction techniques.

Mr. Kelley recommended that each producer take the initiative in states in his market area to make soil tests and to develop the correct amount of lime for these materials. Some states have been slow to develop and to apply lime stabilization, but the association's program is making real progress. Part of this program was the production of a 20-min., 16 mm. sound-color motion picture.

One of the outstanding applications of lime to stabilize soils for road building was the experience of the Louisiana Highway Dept. to prepare a farm-to-market road system. The roadway had to be built of the most unsatisfactory material—gumbo—and had to be constructed during rainy weather just before sugar cane harvesting. Willis H. Taylor, Jr., Materials Design Engineer of Louisiana's Highway Department, outlined the techniques used to apply lime for stabilization of these roads.

The National Lime Association's major project for the past year was the production of a movie, "Lime Stabilization of Roads." This film had its premier performance at the convention. It was produced and edited by the staff of the Association with the cooperation and assistance of producers and contractors associated with a number of stabilization jobs.

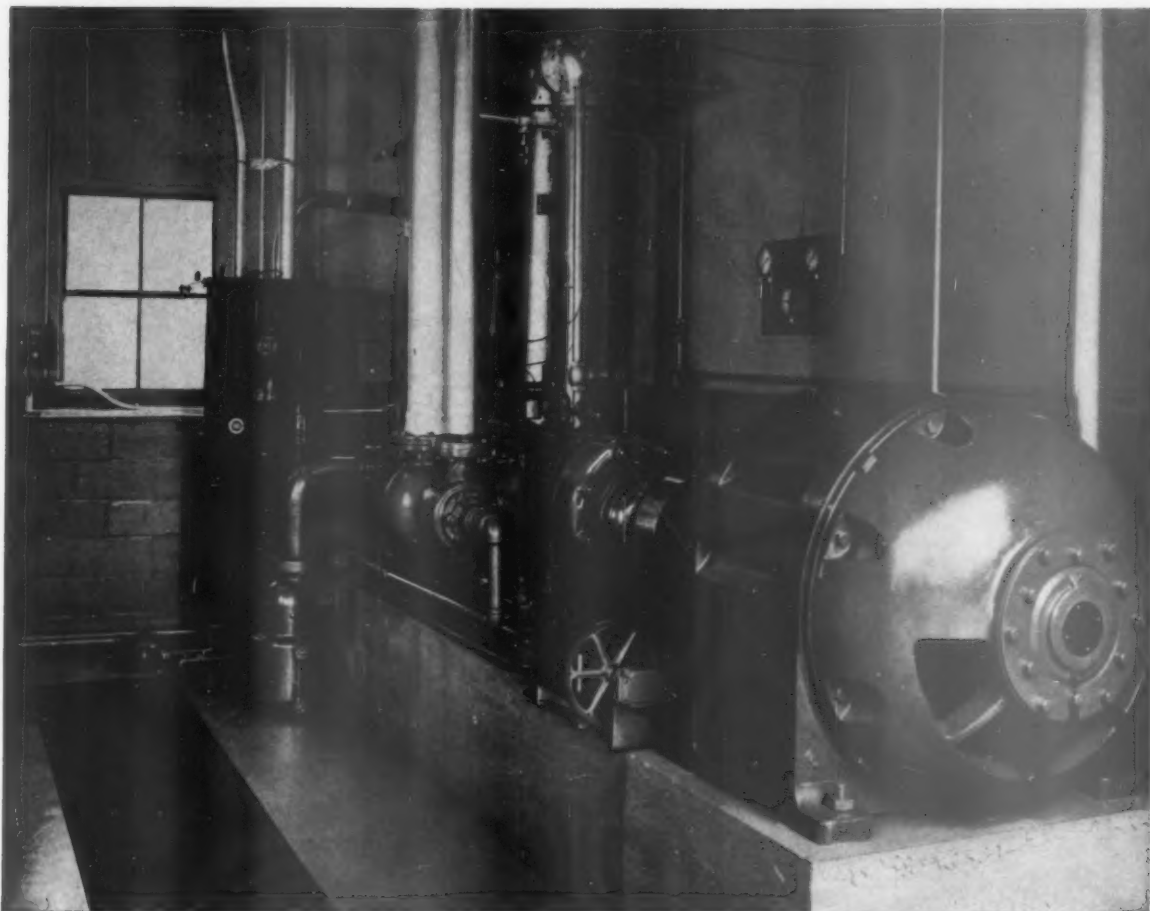
The use of lime in other applications was discussed by several speakers, among them Rudolph C. Valore, Jr., research director of Texas Industries, Inc., J. W. Gilbert of International Paper Co., and John Thornton, consulting engineer.

Safety Award winners for 1957 were announced by Kenneth A. Gutschick, Manager, technical services for the Association. Winner of the class A-1 award was the Galloway, Mo., plant of Ash Grove Lime and Portland Cement Co., with nearly 400,000 man-hours of operation without a lost time accident. Other winners were the plants of National Gypsum Co. at Kimballton, Va., and of Dow Chemical Co. at Ludington, Mich. The Springfield plant of Ash Grove Lime and Portland Cement Co. was cited for its achievement of more than 3,000 days of operation without a lost-time accident.

All of the Association's officers and staff were retained for the next year, including M. A. Rikard, president, and Paul Sunderland, treasurer. Newly elected vice president is John Junkin, sales manager for Warner Co., Philadelphia.

END





Fuller Rotary Two-Stage Compressor, C135-135H. Capacity 680 c.f.m., 100-lb. pressure, 690 r.p.m., 150 hp. motor.

## 16,000 HOURS OF OPERATION WITH NO MAINTENANCE

Empire Steel Castings, Inc., Reading, Pennsylvania, installed a C-135-135H Fuller Rotary Two-stage Compressor in April 1953. After 32 months—approximately 16,000 hours of operation—the compressor received a routine inspection, when a new set of blades was installed in the higher-pressure cylinder.

The Empire engineers report no downtime since replacement, although they've added 4,000 operating hours. Prior to switching to Fuller, their former experience with compressors was a different story—

as many as several overhauls in one year. With Fuller equipment furnishing a constant high capacity air supply, production costs have been greatly reduced.

Here's how Empire uses compressed air:

- In the molding department, supplying all air for pneumatic rammers, all squeeze and jolt machines, automatic set-out and lifting apparatus of mold conveyors, automatic shake-out machines, mold cleaning and spraying equipment.

- In the core department, for ramming

equipment, spraying and torch drying equipment, core oven operation as well as core blowing equipment.

- In the cleaning department, pneumatic chipping hammers and grinders, blacksmith requirements, sand-blasting, pressure testing and miscellaneous tools.

- In the heat-treating department, heat treating furnace operation and cooling equipment.

To get all the facts and engineering data, write today for Bulletin C-5A.

C-298  
3662

"See Chemical Engineering Catalog for details and specifications"



**FULLER COMPANY**  
102 Bridge St., Catasauqua, Pa.

SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION  
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**Fuller**

PIONEERS OF HIGH-EFFICIENCY VANE TYPE ROTARY COMPRESSORS SINCE 1930

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ROCK PRODUCTS, July, 1958

145

# NEW U.S. PATENTS

OLIVER S. NORTH

## Recently issued patents on nonmetallic minerals\*

### Lime

2,833,626—Improved process for hydration of high-calcium or dolomitic lime whereby impurities are largely eliminated and maximum recovery of lime values is realized. Quicklime is reacted with re-cycled lime-water, and the hydrate separated into coarse and fine fractions. The coarse fraction, consisting of impurities and unhydrated or partially hydrated lime particles, is agitated with water and the resultant aqueous lime suspension returned to the hydration stage, where it is used instead of plain water. Agitation of the coarse fraction causes breakdown of large lime particles so as to facilitate hydration and recovery thereof when sent through the hydrator a second time. (to N. V. S. Knibbs and E. G. S. Thyer. Assigned to Fawham Developments Ltd.)

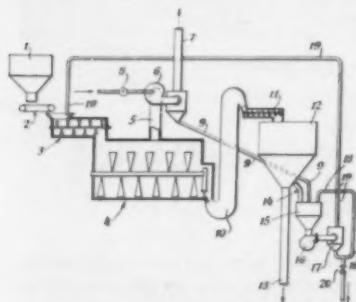


Diagram of Patent No. 2,833,626

The plant shown in the diagram is the arrangement used for treating a high-quality, low-residue lime. Minus 1/2-in. quicklime is fed at a constant rate from hopper (1) to premixer (3) where it is agitated rapidly with the aqueous suspension produced by treatment of coarse tailing. Material then is agitated slowly in hydrator (4) to form hydrated lime. Dust-laden steam leaving via pipe (5) is washed in washer-preheater (6), steam therefrom being exhausted to atmosphere through pipe

(7) and the dust being mixed with water to form milk of lime. Product from hydrator is raised by elevator (10) to worm conveyor (11) which feeds it to air separator (12). Fine hydrate exits pipe (13) and is bagged. Coarse tailing enters tank (15), which is maintained about three-fourths full of liquid by addition of milk of lime through pipe (9) and recirculation from cyclone (17) through pipe (18). Pump (16) draws from tailings tank (15) and delivers to wet cyclone (17), where an aqueous suspension of unhydrated and partially hydrated lime particles is formed for return to premixer through pipe (19). Cyclone underflow is recirculated to tailings tank, and the residue of impurities is drawn off at intervals through valve (20).

### Phosphate rock

2,832,469—In the electrostatic beneficiation of phosphate rock of the Florida pebble variety, phosphate recovery is increased to about 95 percent by washing and scrubbing a non-responsive fraction from a previous separation, drying the material, and inducing the dry particles to accept differential electrical charges. Material is then passed through additional free-fall electrostatic separation units. (to J. E. Lawver. Assigned to International Minerals & Chemical Corp.)

### Aggregates

2,828,164—Conduit discharge device for ejecting suspensions of water and sand in such manner as to form a uniformly spread pile sloping away from a backstop. A flow-reversing chamber is affixed to the end of the flume or closed pipe conduit, and the flow of sand and water strikes this chamber and is reversed and immediately discharged to the pile. Sand accumulates evenly on the pile, and the water drains without eroding the pile as does a stream directing material straight onto the pile. If the backstop is a bulldozed local pile of sand, the second batch of sand can be laid against it without eroding the bulldozed pile. (to P. Spence.)

### Cement

2,830,802—Support means for protecting driving mechanism of portland cement rotary kilns against damage resulting from warping and twisting of kiln shell when in use. Both rigid and resilient supporting elements are utilized. (to L. Petersen. Assigned to F. L. Smidth & Co.)

2,831,270—Grizzly for use with a portland cement clinker cooler. Grizzly bars define spaces having wider openings below than above; hence, any piece of clinker passing top of the opening will fall on through and not be caught and cause clogging. (to W. J. Hartwig. Assigned to Allis-Chalmers Mfg. Co.)

2,833,412—Method and apparatus for screening clay, portland cement, etc. Screen is not vibrated; instead, pulsations of a liquid or gas medium alternately raise and lower the bed of material on a horizontal screen and undersize works through. Maximum extraction of fine fraction is attained. (to N. Ahlmann. Assigned to F. L. Smidth & Co.)

### Mineral wool

2,829,959—In the production of mineral wool from blast-furnace slag, iron content of the molten slag is reduced to not more than 0.4 percent with carbon, aluminum or silicon, and then about 5 percent of silicic acid is added and the slag heated in an oxidizing flame to melt the constituents and desulfurize the slag. (to H. Knüppel. Assigned to Dortmund Hüttenunion Aktiengesellschaft.)

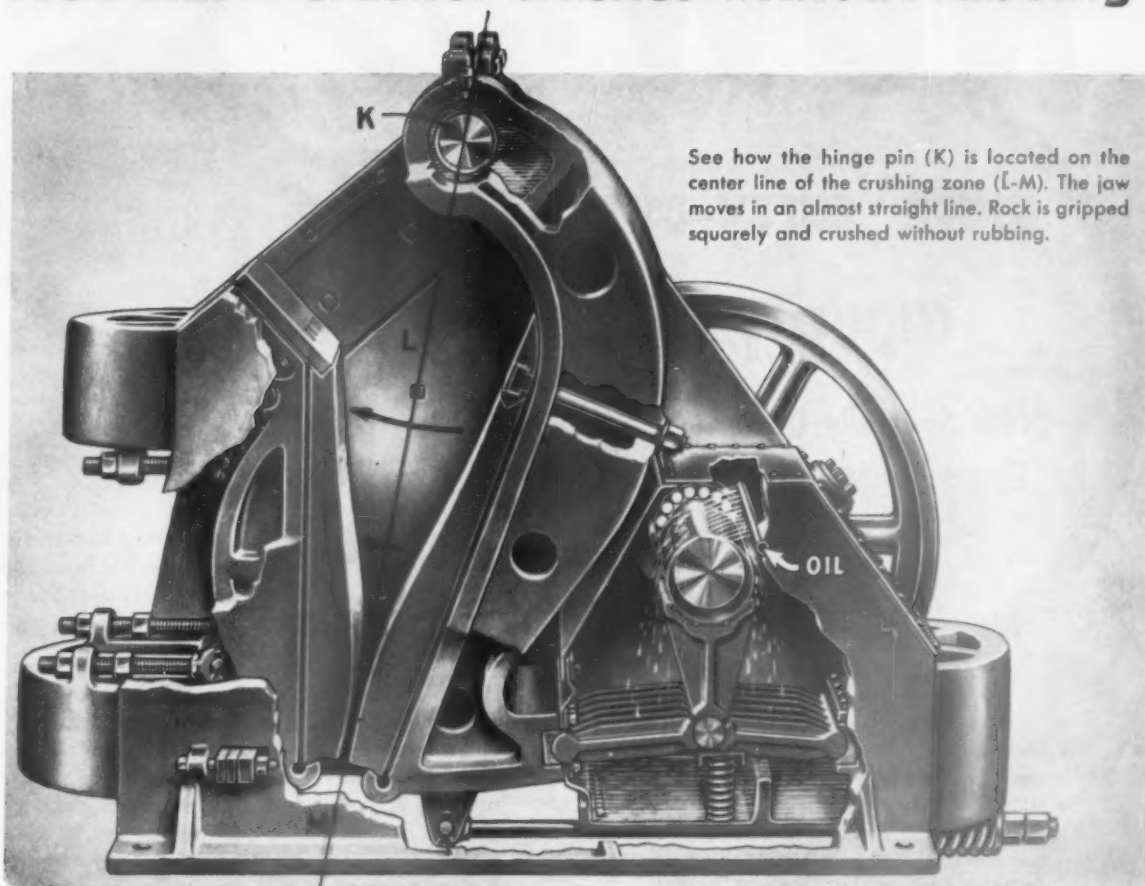
### Barite

2,834,463—Process and reagent for froth flotation beneficiation of barite ore to produce a high specific gravity concentrate. Ground ore is treated with a mahogany petroleum sulfonate to make the barite particles floatable. Specific gravity of concentrate can be controlled at 4.20 or higher. (to K. C. Vincent. Assigned to National Lead Co.)

END

\*Copies of United States patents are available at a cost of 25 cents each from The Commissioner of Patents, Washington 25, D.C. For convenience, coupons, each good for one copy of any patent, may be purchased from that official at the rate of \$5.00 per 20-coupon pad or \$25.00 per 100-coupon pad.

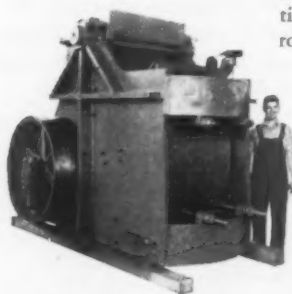
# Jaw plates last at least 5 times longer . . . KUE-KEN® Crusher crushes without rubbing



See how the hinge pin (K) is located on the center line of the crushing zone (L-M). The jaw moves in an almost straight line. Rock is gripped squarely and crushed without rubbing.

Rubbing, the main cause of jaw plate wear in ordinary crushers, is eliminated in Kue-Ken with its exclusive "crushing without rubbing" action. The jaw moves in almost a straight line gripping rock squarely and crushing. Replacement cost and downtime for changing jaw plates is only one fifth as much as ordinary crushers because Kue-Ken jaw plates last at least 5 times longer . . . the harder the rock, the longer the comparative

jaw plate life and the greater the savings. Kue-Ken uses far less power because none is wasted wearing out jaw plates. The mechanism operates in a sealed, dust-tight crankcase lubricated by filtered oil to permit higher speed for greater capacity and a more uniform product. Wear is negligible and shutdowns common to conventional crushers are practically eliminated. Automatic flywheel release prevents breakage from tramp iron. Kue-Ken crushes at the lowest cost per ton. There is a size to meet every need.



Write for Catalog

## KUE-KEN® CRUSHERS

"Crushing without Rubbing"

**STRAUB MFG. CO., INC.** 8390 Baldwin St., Oakland 21, Calif.  
Jaw Crushers Gyratory Crushers Overhead Eccentric Crushers Revolving Screens  
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ROCK PRODUCTS, July, 1958

147

# NOW!

## more "carry-out" capacity

**New Specially Designed  
Page Automatic Bucket  
for Sand...Gravel...  
Quarry Operations**



Dotted line shows  
higher, longer basket of  
Page Sand & Gravel Bucket

- Longer, Higher Basket for more "carry-out" capacity on every swing
- USS "T-1" Steel Construction... "T-1" has more than 3 times the strength of ordinary steel; Offers LONGER LIFE . . . LESS REPAIR AND MAINTENANCE COSTS



New Page Sand & Gravel Bucket uses shorter dump rope for underwater digging. This throws front of bucket sharply back when hoisting to prevent spillage, and to utilize built-up basket for additional capacity.

Here's a new Page Automatic Bucket specifically designed for more profitable sand, gravel, and quarry operations. Made of high strength USS "T-1" alloy steel for maximum resistance to wear and abrasion, the new Page Sand & Gravel Bucket has a built-up basket to give up to 25% more carry-out capacity, assure higher production and more efficient dragline operation.

The higher, longer basket (shown by the dotted line) will move more material per swing; it is especially effective in underwater digging, where the material has a natural tendency to flow with the water in a direct line from the rear top of the basket to the lip.

Page Sand & Gravel Buckets are made in capacities from  $\frac{1}{4}$  cubic yards and up. They are available for quick delivery.

*Write for special Sand & Gravel Bucket circular*

**Page**  
Automatic Dragline  
Buckets  
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# NEW LITERATURE

## Plant safety

NATIONAL SAFETY COUNCIL has brought out two safety publications. "Rules for Safety," directed at employees, discussed accident prevention, giving rules for using power tools, stacking material, lifting and carrying. Book 8, containing 52 safety talks for foremen, covers many major types of occupational accidents.

Enter 700 on Reader Card

## Research and testing

KENNEDY-VAN SAUN MFG. & ENG. CORP. is distributing Bulletin D-1005 describing the facilities of its test and research center which specializes in solving problems in grinding, crushing, calcining, classifying, conveying and screening.

Enter 701 on Reader Card

## Tractor maintenance

CATERPILLAR TRACTOR CO. has prepared Form DE730, a maintenance guide for operators of its No. 933, No. 955 and No. 977 Traxcavators. Points discussed include cooling system care, adjusting track tension, proper air cleaner service, fuel system care and fuel storage methods.

Enter 702 on Reader Card

## Gear reducers

CRICHTON CO. has prepared a bulletin covering its seven basic Swedish style planetary gear reducer models available in ratios from 3.5:1 to 216:1. Output horsepower ratings are provided for all models.

Enter 703 on Reader Card

## Sand and gavel jig

JEFFREY MFG. CO. is distributing Bulletin 892 covering its heavy-duty sand and gravel jig. Photos of a jig installation at work in an aggregates producing plant are presented. Also provided are specifications and dimension drawings.

Enter 704 on Reader Card

## Closed circuit TV camera

GENERAL ELECTRIC CO. has released Bulletin ECL-65 describing its single-

unit Type TE-6-A closed circuit television camera for use with any standard television receiver. Features of the three Intra-Tel models are discussed as well as possible applications.

Enter 705 on Reader Card

## Induction motor

THE LOUIS ALLIS CO. has made available Bulletin 1900 describing its "Syncro-Spede" synchronous induction motor. Applications discussed include high frequency drives, precise timing, metering and recording devices, constant speed conveyor drives, high speed applications and adjustable frequency multi-motor systems.

Enter 706 on Reader Card

## Sand flotation reagents

ARMOUR AND CO. has published Bulletin G-14 describing its anionic and cationic reagents for reducing heavy mineral content of silica sand during the flotation separation process. Examples of various flotation methods are given, showing the type and concentration of reagents required.

Enter 707 on Reader Card

## Electric vibrators

SYNTRON CO. has brought out a booklet describing its 14 standard electric vibrator and controller models. Photographs illustrate typical product uses and application methods.

Enter 708 on Reader Card

## Shovel dippers

ELECTRIC STEEL FOUNDRY CO. has published Bulletin 189-C describing its line of quarry, hopper and backhoe shovel dippers. A dipper selector guide is provided to help in selecting the proper dipper for a machine and particular digging or loading conditions.

Enter 709 on Reader Card

## Meters and controls

BAILEY METER CO. is offering Bulletin 500 describing the purpose, design and operation of its metering and control systems. Included is a discussion of pneumatic and electric tele-metering and pneumatic control.

Enter 710 on Reader Card

## Tire care

B. F. GOODRICH TIRE CO. has published a highway truck tire data book discussing nine factors that determine the degree of service to be received from truck tires. Points covered include tire selection, inflation, loads and load distribution, tire rotation and rims. Safety rules to follow when servicing tires are suggested.

Enter 711 on Reader Card

## Conveyor tunnels

ARMCO DRAINAGE & METAL PRODUCTS, INC. has prepared Bulletin CS-9456 describing its Multi-Plate structures and Liner Plate conveyor tunnels for aggregates handling. Photos are provided of tunnel assembly and plant installations.

Enter 712 on Reader Card

## Washing, classifying units

EAGLE IRON WORKS has published 40-page Catalog 58 describing its washing and classifying equipment for the sand, gravel and crushed stone industries. Photos of plant installations and unit diagrams are provided, as well as a section covering a portable sand washing-classifying-dehydrating section for aggregates plants.

Enter 713 on Reader Card

## Centrifugal precipitator

AMERICAN AIR FILTER CO., INC. has issued Bulletin 276 describing its Skimmer centrifugal precipitator, available in 13 sizes handling air volumes from 600 to 40,000 cfm. Drawings and photos show construction features, dimensions and possible arrangements of the units.

Enter 714 on Reader Card

## Bottom-dump motor wagon

ALLIS-CHALMERS MFG. CO. has made available Catalog MS-1269 describing loading, hauling and dumping features of its TW-260 bottom-dump motor wagon. Also presented are action photos, catalog views and specifications.

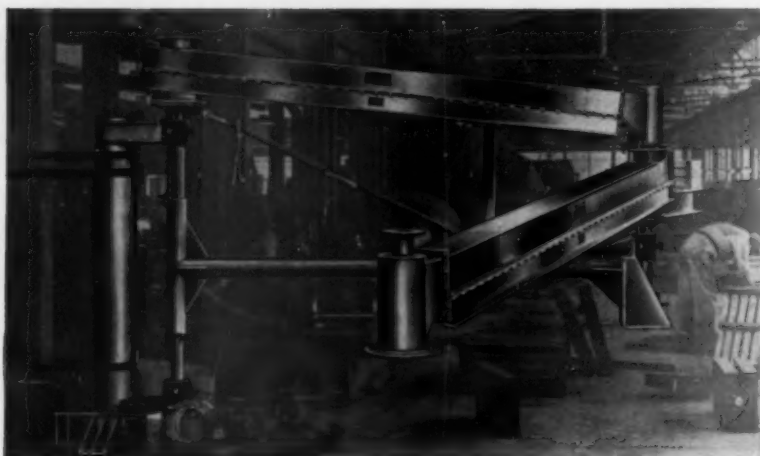
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END

# NEW

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## MACHINERY



### Fluidizing conveyor swivels to feed any location

A DOUBLE-SWIVEL FLUIDIZING CONVEYOR eliminates time and labor spent in positioning a bulk material discharge point above multiple receiving inlets. According to the manufacturer, the double-swivel Airslide conveyor feeds an unlimited number of locations within its scope of movement.

Two lengths of conveyor sections are coupled together in a double-swivel system to form the new unit, which is maneuverable by one man from one discharge point to another. Available in all standard sizes and capacities, the conveyor will handle dry pulverized, crushed and granular material pneumatically in bulk. Permanently set up at the primary bulk delivery point, the unit can be "folded" back out of the way when not in use. *Fuller Co., Catasauqua, Pa.*

Enter 300 on Reader Card

### Experimental tractor powered by gas turbine



AN EXPERIMENTAL CRAWLER TRACTOR in which a gas turbine power unit replaces the conventional diesel engine has been announced. The experimental model, named the P-91, has been assembled for purposes of research. The design of the gas turbine involves the equivalent of a "built-in" torque converter. Ability of the turbine to deliver the range of speed and flexibility of power required for successful tractor operation will be tested and evaluated.

According to the company, exhaust gases, while greater in volume, have been handled in such a way as to avoid any inconvenience to the operator. Noise level of the experimental unit is reported to equal that of the diesel-powered unit, although the pitch and character of the sound is different. *Allis-Chalmers Mfg. Co., Milwaukee, Wis.*

Enter 301 on Reader Card

### Blasting agent

A SMALL-DIAMETER blasting agent, particularly suitable for limestone mining, has been announced. The new "Accomite" blasting agent has a minimum diameter of 1½-in. and a length of 16 in. Accomite is a non-nitroglycerine blasting agent. In the 1½ x 16-in. size, this explosive has a cartridge count of 45 per 50 lb. The fume clas-

sification is rated good and the water resistance as poor.

The 1½-in. explosive is insensitive to a No. 8 electric blasting cap and thus requires the use of a primer. It is important that compaction and column continuity be achieved in the borehole. Analyses for specific applications are available on request. *American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y.*

Enter 302 on Reader Card

### Horizontal screen



A NEW HEAVY-DUTY "Straightline" horizontal vibrating screen, CL-Model 58, has been designed for dewatering, washing and sizing a wide variety of materials where head room is limited. The new screen can be cable-suspended or floor-mounted; where conditions warrant, a combination of both mountings can be used.

According to the manufacturer, the screen achieves a high intensity motion by centrifugal force, unbalanced-shaft vibrators. Two eccentric shafts in the vibrator, supported by heavy-duty oversize self-aligning bearings, are rotated by a helical gear speed reducer, giving the screen its straightline motion.

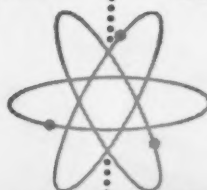
These vibrating screens are made with single or double decks in 15 sizes ranging from 4 x 8 ft. to 6 x 16 ft. All screens are equipped with a snubbing device that limits motion during acceleration and deceleration and is said to automatically eliminate critical vibration in the resonance speed range. *Link-Belt Co., Prudential Plaza, Chicago 1, Ill.*

Enter 303 on Reader Card

(Continued on page 152)



**WEIGHING...**



**BATCHING...**



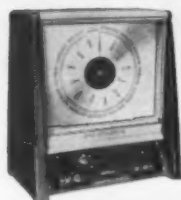
# Fairbanks-Morse Scales Offer New Economy, Accuracy, Speed...Electronically!



Belt conveyor scale and instrument



Read-out to autotype or tape



Desk instrument for weighing



Desk instrument for weighing and printing



Punch card operated sequence batcher



Sequence batcher for manual programming

## Even Adapts to Present Mechanical Systems

Fairbanks-Morse electronic control and instrumentation permits remote location of weight recording instruments...assures automatic balance detection...automatic ranging without drop-weights...automatic zeroing...pushbutton recording and much more.

This same electronic control of weight measurement can be employed to streamline your batching operation. You can select precise quantities of all materials...in proper sequence...at the push

of a button. Or you can put the batching formula on a punch card and do the whole job automatically.

Weight readings can be fed to automatic typewriters, adding machines, tape punchers, etc. Chances are your present lever system can be converted to electronic operation.

For more information write today for new literature. Fairbanks, Morse & Co., 600 S. Michigan Avenue, Chicago 5, Illinois.



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ROCK PRODUCTS, July, 1958

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151

## NEW MACHINERY

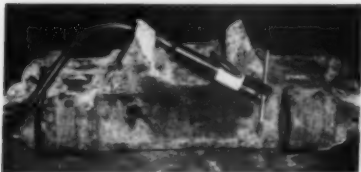
(Continued from page 150)

### Meter transmitter

A NEW METER pneumatically transmits rate of flow measurements to indicating, recording, integrating and controlling equipment at remote stations. Called the Area Meter Transmitter, the unit is installed in a pipe line like a valve. Differential pressure remains constant across variable area metering ports; thus the position of the metering plug is directly proportional to rate of flow. A spring-loaded model measures both high and low capacities of flow and is especially suitable for highly viscous liquids. *Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio.*

Enter 309 on Reader Card

### Metal cutting torch

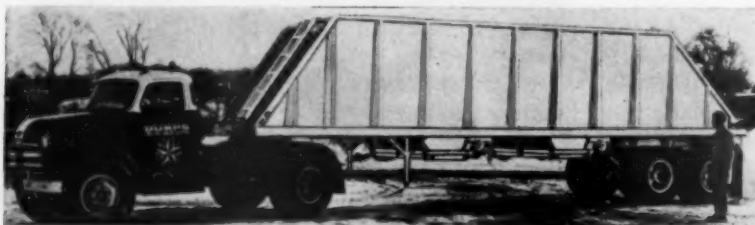


THE ARCAIR TORCH, a revolutionary means of metal removal, employs a special "Copperclad" carbon-graphite electrode and a built-in parallel jet of compressed air at 80 to 100 psi. to melt metal and blast it aside.

In the removal of worn hard-surfacing in preparation for resurfacing, the job is accomplished 10 times faster than formerly required to chisel and grind. *Arcair Co., 447 S. Mt. Pleasant Ave., Lancaster, Ohio.*

Enter 310 on Reader Card

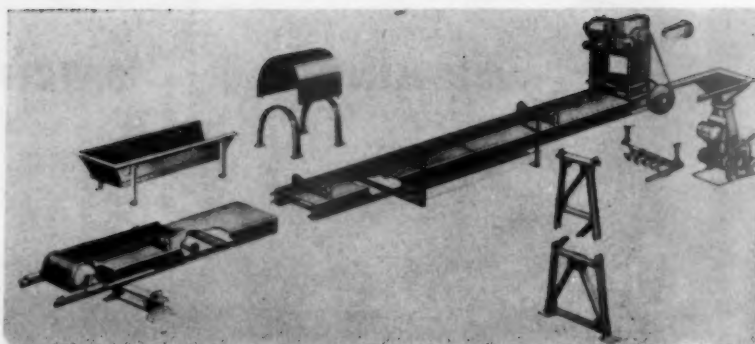
### Bottom-hopper trailer is made of aluminum



A NEW ALL-ALUMINUM, two-compartment bottom hopper dump trailer with a 33-cu. yd. capacity for over-the-road hauling has been announced. The trailer is 35 ft. long, and was tested in Ohio as being able to carry legally in excess of 50,000 lb.

The design of the trailer includes features to provide increased vertical and lateral strength, minimizing deflection. As a rigidity feature, the side panels are formed from a one-piece solid aluminum plate, incorporating heavy-duty rub rails, supporting tapered pyramids flared to cover a large area of the rub rail and boxed and capped upper flange. *Lodestar Corp., Niles, Ohio.*

Enter 311 on Reader Card



### Belt conveyor features flexibility of operation

A PRE-ENGINEERED SECTIONAL BELT CONVEYOR featuring bent-plate decking has been introduced. The new packaged unit, complete with head and tail assemblies, supporting "A" frames, and intermediate section of bent-plate decking, is available in 18, 20, 24, 30 and 36-in. belt widths, with drives ranging up to 50 hp.

With bolt holes punched every 8 in. in rows on top, bottom and along sides, the 12-ft. sections of steel decking are said to provide for simple

erection or alteration of conveyor. Return rollers and returning belt are mounted on its underside, shielded from weather and falling material. *Stephens-Adamson Mfg. Co., Ridgeway Ave., Aurora, Ill.*

Enter 313 on Reader Card

### Tractor-shovel



PRODUCTION OF A NEW "PAYLOADER" model, the H-25, has been announced. It is said to be the first rubber-tired, front-end loader with a rated carrying capacity of 2,500 lb.

Although the new model has more capacity and is larger and heavier, it can be operated in and out of boxcars having 6-ft. doors. It is said to have a shorter turning radius (6 ft. to the outside rear hub) than any other rubber-tired tractor-shovel. Power-steering is a standard feature.

A new power-shift transmission and new torque-converter are matched to provide the maximum in speed of movement and ease of operation.

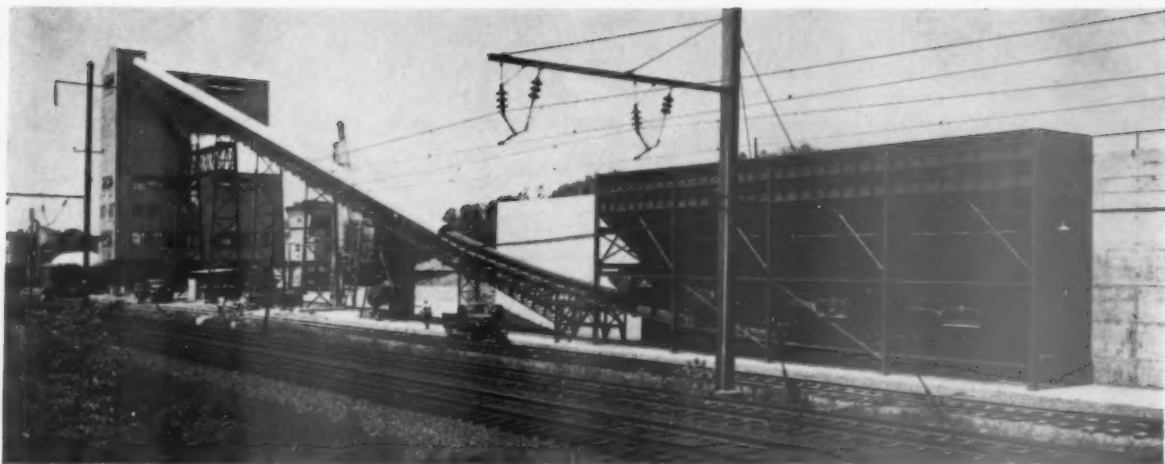
The new model is being offered with a choice of gasoline, diesel or LPG power. The 44-hp. gasoline engine is equipped with wet sleeve cylinder liners for easier maintenance and the overhead valve design provides greater efficiency.

For handling of dense, compacted materials, the loader has a breakout force of 4,500 lb. and provides a bucket tip-back of 40 deg. at ground level. *The Frank G. Hough Co., 776 Seventh Ave., Libertyville, Ill.*

Enter 314 on Reader Card

(Continued on page 155)





## **NEW FULLY-AUTOMATIC CENTRAL-MIX PLANT OF J. D. M. MATERIALS CO., INC., SOUTHAMPTON, PA.**

**- - DESIGNED AND BUILT BY FANNING-SCHUETT**



This batcher has  $6\frac{1}{2}$  cu. yd. capacity and is fed from overhead bins through gates each operated by its own air cylinder and solenoid.



Latest design "wrap" type drive allows 270° utilization of drive pulley. All machinery is at ground level for easy service. Air tight casing houses roller chain drive to main pulley.

The new central-mix concrete plant of J. D. M. Materials Company, Inc., Southampton, Pa. is one of the country's outstanding examples of automation applied to the cement and concrete industry. Not only the batching equipment and storage bins, but even raw material supply equipment is automatically controlled.

Raw materials are fed into the receiving hoppers from trucks and a 400 ft. belt conveyor carries these materials at a rate of 720 tons per hour to the head house of the batching plant and storage bins.

The batcher has a  $6\frac{1}{2}$  cu. yd. capacity and is fed by overhead bins through gates individually operated by air cylinders.

An ingenious push-button control system operates practically every piece of equipment in the plant.

This complete new plant, a model of automatically controlled precision, was designed and built by Fanning-Schuett Engineering Company.

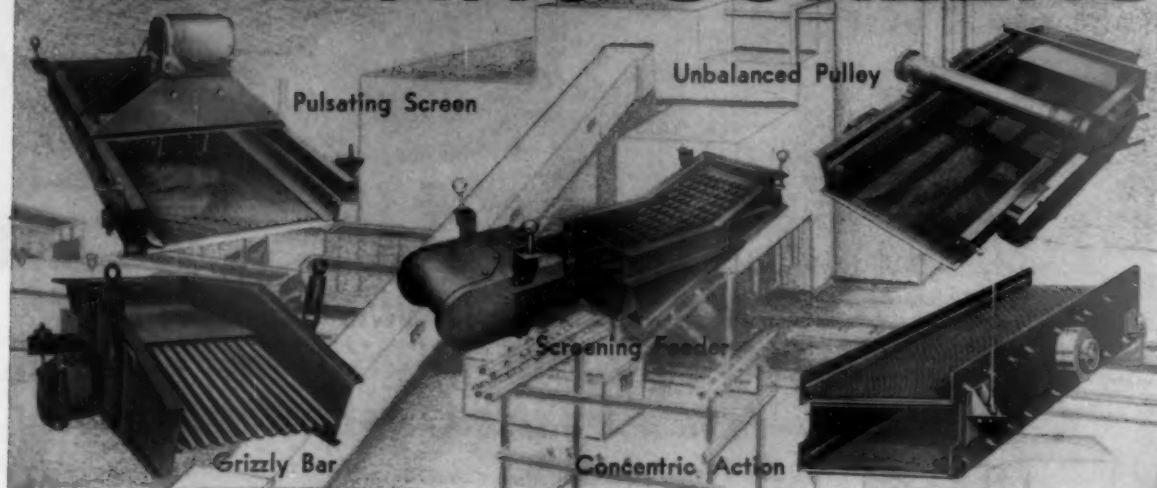
### **AUTOMATIC CONTROL**

Although the plant shown above is completely automatic, Fanning-Schuett can offer varying degrees of automation as required. Starting with a minimum of automatic control for the small operation and progressing to the completely automatic plant, there is a degree of automation to fill your needs. Let us help you find it.

**FANNING-SCHUETT ENGINEERING COMPANY**  
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**. . . at lower costs**

**less maintenance**

SYNTRON Vibrating Screens provide an efficient, economical solution to every screening problem — for scalping, separating and sizing — for coarse screening and feeding of basic materials — for particle size control in processing quality materials or in reclaiming waste materials.

SYNTRON builds five types of screens in a complete range of sizes and modifications. Electromagnetic or electromechanical drives — single, double or triple decks — combination screens and feeders — with grizzly bars — any requirement necessary for your particular application.

SYNTRON Vibrating Screens are engineered for high capacity output with low operating and maintenance costs. Ruggedly constructed of quality materials by experienced craftsmen for long, dependable, trouble-free service.

The experience of more than a third of a century are built into SYNTRON Vibrating Screens. This experience is yours without cost or obligation. Send complete details of your screening problem to our application engineers for recommendation.

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Vibratory Screens

Shaker Conveyors

Vibratory Elevator Feeders

Weigh Feeders

Packers and Jolters

Hopper Feeders

Lapping Machines

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a-c to d-c Selenium Rectifier Units

Electric Heating Panels

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Concrete Vibrators

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## NEW MACHINERY

(Continued from page 152)

### Truck diesel

A NEW DIESEL ENGINE for trucks which is 750 lb. lighter than its nearest competitor in the 210-hp. range has been introduced. Its lighter weight, attained through the liberal use of aluminum alloys in the cylinder block and other major components, permits increases in truck payload capacity.

The engine, a six cylinder model, is the latest addition to Detroit Diesel's new line of "71-E" truck engines. Its weight of only 1,710 lb. establishes a new low for truck diesels of comparable horsepower. Despite its low weight the new engine is said to retain all the durability of standard cast iron models. Its design includes the recently introduced four-valve head and new high-economy fuel injectors and pistons.

The new unit develops its peak horsepower at 2,100 rpm. with its maximum torque of 577 lb. ft. occurring at 1,200 rpm. These performance characteristics, together with the two-cycle operation of these units, make an important contribution to higher average road speeds under practically all highway conditions, according to the manufacturer. *Detroit Diesel Engine Division of General Motors, Detroit 28, Mich.*

Enter 331 on Reader Card



### Portable drill rig

A PORTABLE ROTARY drilling rig, designed for use by the mining, quarry, highway, and construction industries, has been announced. The unit is mounted on a GF-660 Crane Carrier truck with a GMC 4-71 diesel engine. The truck engine furnishes power for the rotary table. The air compressor on the rig is a Le Roi model 100-S2 and it is powered by a GMC 6031-C

diesel engine, with hydraulic full load governor.

The new rig is designed to use both conventional type rock or drag bits and also the new down-the-hole tools. Down-the-hole tools are recommended by the manufacturer for extremely hard formations. Three hydraulic leveling jacks are standard equipment on the unit. *George E. Failing Co., Enid, Oklahoma.*

Enter 332 on Reader Card



### Kiln chain

A NEW LINK SHAPE for Thermopruf kiln chain has been introduced for application in wet process cement kilns, lime sludge kilns and wash mills. According to the manufacturer, the new chain provides one-third more heat transfer surface than conventional chain, permitting a saving in operating heat requirements and a reduction in chain system size.

The increased cross-sectional area also provides greater wear resistance with larger open link areas, allowing maximum flow at the feed end of the kiln and increased heat transfer efficiency throughout the chain system. For the first time, chain is available by the link or in lengths, complete with end links, to meet specific chain system requirements. *Allis-Chalmers Manufacturing Co., Milwaukee 1, Wis.*

Enter 333 on Reader Card

### Centrifugal collectors

A LINE OF SERIES "C" centrifugal dust collectors is now available. Included are two design types, totaling 41 sizes. Equipped with a relatively small diameter, long cone, the Design 5 collector is a high-centrifugal-force unit designed primarily for dust sizes below 44 micron, such as cement. Normally rated at 4-in. water column sp. at standard air density, these collectors can be utilized for extremely high efficiency down to 20 micron on all sizes. Only small diameter units may be used in the range from 5 to 10 micron. Capacities from 260 to 6,500 cfm. are available. *The Kirk & Blum Mfg. Co., 3100 Forrer St., Cincinnati 9, Ohio.*

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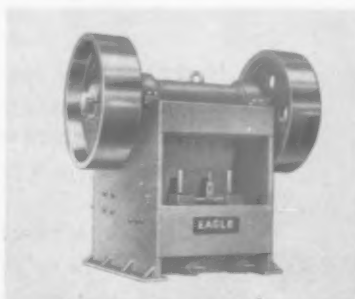
### Tractor shovel

A NEW 2¼-CU. YD. TRACTOR SHOVEL, Model 200, has been designed and built for heavy-duty work. The unit features underslung arms for operator visibility and safety. At no time do cylinders, hoses, etc., protrude past the operator's cockpit.

The bucket has 40 deg. tipback at ground level. Maximum dumping height is 9 ft. 6 in. It has forward reach of 5 ft. 7 in. at dumping height of 7 ft., an Allison Torqmatic full reversing transmission and 4-wheel drive Timken-Detroit planetary axles. Model 200 is powered by a Continental M-363, 363-cu. in., 117 hp. gas engine or GM 3-71 diesel. Weight of the gas model is 19,500 lb.; diesel, 20,100 lb. *N. P. Nelson Iron Works, 850 Bloomfield Ave., Clifton, N.J.*

Enter 335 on Reader Card

### Jaw crusher



A NEW JAW CRUSHER with a 30 x 42-in. feed opening has been announced. This model will serve in many cases as a primary crusher, according to the manufacturer.

Rated capacity is 125 to 400 tph. Over-all weight of crusher alone is 55,000 lb. A 125 to 150-hp. motor is required to attain and hold normal operating speed of 200 rpm. Other features include a 58-in. fly-wheel, reversible jaws of manganese steel, special bearings and special alloy steel in the eccentric shaft. The safety toggle seat of the pitman is replaceable and crusher jaws are adjustable (while operating) from ½ to 8 in. *Eagle Crusher Co., Galion, Ohio.*

Enter 339 on Reader Card

(Continued on page 157)



## We all like to watch things grow!

Every business man seeking a new industrial site hopes to put his manufacturing roots down where they will take hold . . . where they will produce a growing, prospering plant.

Many manufacturers have found fertile ground in *The Land Of Plenty*, the progressive six-state territory served by the Norfolk and Western. Here the profitable growth of new plants is nurtured by dependable workers, nearness to markets,

abundant raw materials, ample water and power, dependable N&W transportation and other elements.

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# Norfolk and Western RAILWAY



## NEW MACHINERY

(Continued from page 155)



### Vibratory feeder

AN UNUSUAL COMBINATION of infra-red heat lamps and a "Hi-Vi" vibratory feeder is employed by a graded sand company to assist in maintaining quality control standards in processing of abrasive materials.

As the feeder supplies a constant, uniform flow of sand from storage bins to screening machinery, the battery of infra-red lamps installed above it eliminates minute micron surface moisture, thus reducing the surface area of sand particles and minimizing binding in the screens. Abrasive sands supplied by the company are extremely fine, and are held to very close tolerances at both ends of any individual grade.

According to the manufacturer, the vibratory feeder has an electro-permanent magnetic drive that requires no rectifier and needs only to be plugged into an available ac line. *Eriez Mfg. Co., Erie, Pa.*

Enter 304 on Reader Card

### Versatile conveyor



DESIGNED PRIMARILY for placing concrete, the Fairfield Faircrete conveyor is being used for an increasing variety of jobs. In this photo, the con-

veyor and a car unloader are stockpiling sand from a gondola rail car. The sand is handled quickly and with a minimum of spillage, according to the conveyor's manufacturer.

The conveyor, when used as a stockpiling machine, has a maximum discharge height of 27 ft. and its capacity is increased by the use of cleats on the 18 in. wide rubber belt. The conveyor's versatility for stockpiling is further enhanced by the use of swivel wheels which turn the unit into a radial type stacker. The unit has also been used for unloading directly out of a gondola car without the use of a car unloader.

The conveyor comes complete with a tow hitch and is available with either gasoline engine or electric motor drive. The 18 in. wide rubber belt rides on 4-in. ball bearing troughing idlers spaced on 30-in. centers. *Fairfield Engineering Co., 324 Barnhart St., Marion, Ohio.*

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### Weight indicator



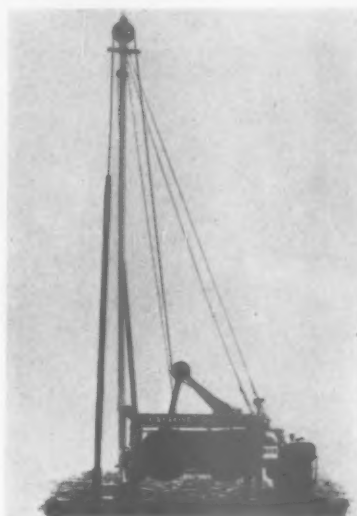
A NEW, IMPROVED VERSION of the "Weightograph" projection-type weight indicator has been announced. The weight indicator projects the actual weight on a large illuminated screen in a non-protruding eye-level periscope housing. It is possible to read accurately weight indications many feet away from the scale. The indicated weight, figures and graduations are all projected optically in the same plane, which eliminates parallax and resulting weighing errors, even when readings are made from an angle.

The weight indicator is said to project weight indication quickly and smoothly with no hunting or overshoot. Weights are clearly visible even in direct sunlight. Chart, pendulum shaft and levers operate on precision ball bearings; the mechanism contains no gears, friction discs, racks, pinions or weighing springs.

Several different models are available, including a double-reading model with weight indication projected on both sides. *Howe Scale Co., Rutland, Vermont.*

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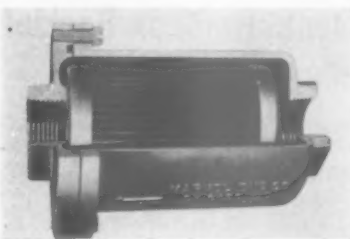
### Prospecting drill



A SMALL COMPACT DRILL for prospecting and quarrying has just been announced. The Cyclone Drillette, as it is called, is equipped with a 20-ft. tubular derrick with two guide lines and a hand crank for raising the derrick. The drillette can be mounted for truck or trailer and can operate from power-take-off equipment. It is a one-man rig—easy to maneuver and quick to erect and take down. It can easily be set into any covered structure for protection against the elements. *Sanderson Cyclone Drill Co., 2005 East Chestnut St., Orrville, Ohio.*

Enter 307 on Reader Card

### In-line filter



A FILTER FOR IN-LINE INSTALLATION to handle hydraulic oil from 10 to 25 gpm. capacities at very low pressure drop has recently been developed. The measurements of the filter are: overall length 6½ in.; head diam. 4¼ in., case diam. 3¼ in., openings 1-in. nptf. at both ends.

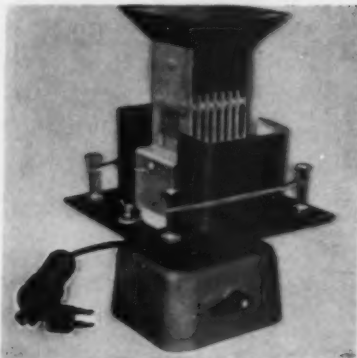
Filtering media of Monel wire cloth are available in mesh sizes from 30 to 100. The cartridge is easily removed for thorough cleaning. *Marvel Engineering Co., 7227 N. Hamlin Ave., Chicago 45, Ill.*

Enter 308 on Reader Card

(Continued on following page)

## NEW MACHINERY

(Continued from preceding page)



### Laboratory sampler

A LABORATORY UNIT designed for mixing fine-grained materials and obtaining homogenous splits and micro-samples is the Sepor microsplitter, shown mounted on the No. 412 Vibrapad. With the device, moderate-sized bulk samples can be reduced to microgram amounts. The splitter incorporates the Jones riffle, consisting of a series of chutes fed by a single hopper. The chutes are so placed that each alternate chute discharges to the same side of the sampler. The original material is divided into four equal parts;

repeating the process divides the original sample into successively smaller subdivisions. The neoprene-coated Vibrapad is mounted on a three-speed vibrator; dimensions are 6 x 6 x 1/4 in. Sepor Laboratory Supply, 3810 N. Broadway Ave., Chicago 13, Ill.

Enter 336 on Reader Card

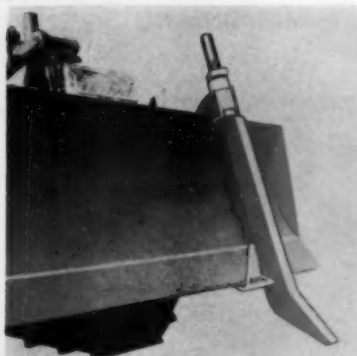
### Truck loader

NOW IN PRODUCTION is a heavy duty truck loader with a versatile self-loading bucket incorporating a hydraulically operated jaw. The jaw swings down and reaches out to meet ground level approximately 13 in. forward of the lip of the bucket. Smoothly completing its closing cycle, the jaw pulls in and holds the "full load" bite in the 1/2-cu. yd. bucket.

The powerful jaw action of the self-loading bucket eliminates the necessity of ramming the truck into a stockpile to obtain a full bucket. Consequently, there are no shock loads on the truck, its frame or the loader mechanism itself.

The loader is designed to fit almost any type of truck, including four-wheel drive units, cab-over, tilt cab and conventional trucks, without violating legal overall truck width restrictions. M-B Corp., New Holstein, Wis.

Enter 337 on Reader Card



### Utility dozer tooth

A QUICK-CHANGE UTILITY DOZER TOOTH has been announced. The new dozer tooth is built of high-strength forged steel and can be mounted on the dozer blade in a few minutes by means of a simple, positive clamp.

The utility tooth saves time and money by adapting the regular dozer blade to short land-clearing and digging jobs encountered from time to time by almost all tractor operators. It is especially useful for removing roots and stumps, and breaking up hardpan. Five sizes fit all dozer blades. Young Iron Works, 2959 1st Ave. S., Seattle 4, Wash.

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END

## The proper bucket application gives you maximum cable life

### New Blaw-Knox Booklet tells you how

Bulletin 2510 illustrates and describes in pictures and text the proper relationship between:

1. Preferred or required direction of bucket opening.
2. Location and contours of the pile of material.
3. Position of the holding and closing drums in the crane trolley.

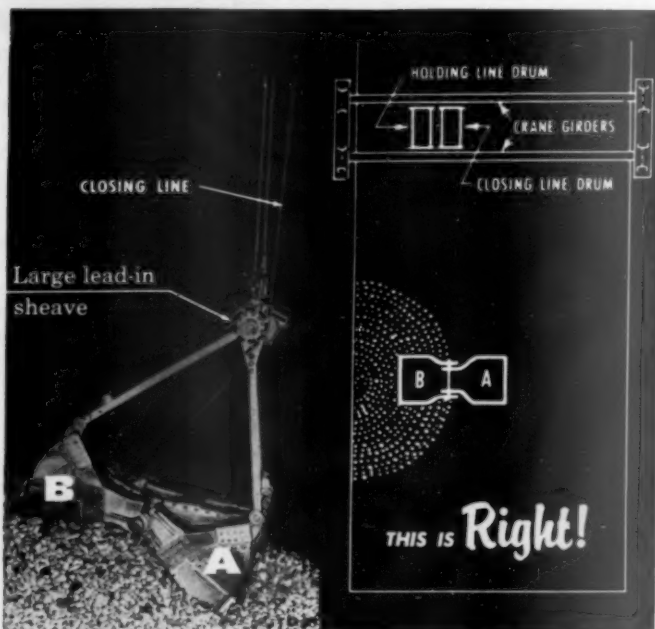
Users report amazing increases in cable life as well as improved bucket performance as a result of applying these practical suggestions. A copy of Bulletin 2510 is yours without obligation. Write for a copy today.

### BLAW-KNOX COMPANY

Blaw-Knox Equipment Division  
Pittsburgh 38, Pennsylvania



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## May Sand and Gravel Corporation installs additional Deister Screens in continuing expansion program

An enviable reputation for meeting specifications and schedules has necessitated a continuous expansion program at May Sand and Gravel Corporation, Fort Wayne, Indiana. The current program calls for extending present capacity from 400 tph to 500 tph. The company, producing both sand and gravel and crushed stone simultaneously from the same plant, has added Deister Screens exclusively in their 1956, 1957 and 1958 programs.

Entire feed from the primary crusher is conveyed to a Deister Type UHS Double-Deck 5' x 14' Scalper (left-hand illustration) with 3½" openings on the top deck and a split screen (with 2" and 7/8" openings) on the bottom deck. In addition, the Scalper produces No. 1 and No. 2 stone. Oversize goes to the secondary crusher, and +7/8"-2" material, plus the discharge from the secondary crusher, is conveyed directly to main screening plant.

Latest addition to May's battery of 9

Deister's (center illustration) are two Type UHS Three-Deck 5' x 14' Screens equipped with 2¼" openings on the top deck, ¾" on the middle and 1/4" on the bottom deck. These are installed in the new main screening plant.

A pair of Deister Single-Deck 4' x 8' Type USL Screens produce Ag-Lime (right-hand illustration). They are equipped with .092" opening slotted stainless steel wire cloth and electric screen heaters.

William P. (Bill) May, President and founder, bought his first Deister in the early '30's. He says: "We've had many years to compare screen performance. That's why we are now standardizing on Deister Screens."

Paul W. Seitz, Vice-President, puts it this way: "It's a simple matter of dollars and cents. Lower costs per ton of aggregate produced is the result of lower maintenance costs and uninterrupted operation. That's why we look favorably on Deister."

J. W. (Jim) Rooney, Superintendent, reports: "They're built to take hard work. For example, our 3-4-12 was installed in March, 1955. It ran 9 hours a day, 6 days a week . . . occasionally up to 22 hours per day. Three years later, in May, 1958, the Vibrating Mechanism was thoroughly checked while we had the screen out to make modifications. Not a single part showed enough wear to justify replacement."

It will pay you to investigate Deister before you invest in replacements or additional screens.

**DEISTER MACHINE CO.**

1933 E. Wayne St., Ft. Wayne, Ind.



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# MANUFACTURERS

## NEWS

### Blaw-Knox names honorary director

CHESTER H. LEHMAN has been named director emeritus of Blaw-Knox Co., Pittsburgh, Pa. Mr. Lehman, who joined the company in 1909, was first elected a director in 1912. He became a vice president in 1934 and from 1937 to 1952 he served as executive vice president and vice chairman of the board. After his retirement in 1952, he continued as a director.

### F. J. Dunleavy named Yale plant manager

FRANCIS J. DUNLEAVY has been named manager of the Philadelphia plant of Yale Materials Handling Division, The Yale & Towne Mfg. Co. Mr. Dunleavy, who joined the company in 1951 as director of pricing and budget control, has been serving as assistant general manager of the division since 1956.

### Rojtman elected president of J. I. Case Company



Rojtman

Beckenbaugh

AT THE ANNUAL MEETING of its board of directors, Marc B. Rojtman was elected president of the J. I. Case Co., Racine, Wis. Mr. Rojtman, formerly president of American Tractor Corp., joined Case in 1957 when the companies merged. He has been serving as executive vice president and general manager. John T. Brown, formerly president and chairman, was re-elected chairman of the board.

Also announced was the promotion of Don A. Beckenbaugh to the newly created position of sales and manufacturing administrator. Mr. Beckenbaugh, who joined the company

in 1928, formerly was a divisional sales manager. He has served as branch office manager, territory supervisor, assistant branch manager and works manager of the company's Rockford, Ill., plant.

### Austin Goodyear to head Hewitt-Robins, Inc.

AUSTIN GOODYEAR, executive vice president of Hewitt-Robins, Inc., Stamford, Conn., has been elected president of the company, succeeding Thomas Robins, Jr., who has held the dual positions of chairman of the board and president. Mr. Robins, who had served as president since 1938, will continue as chairman and chief executive officer.

Mr. Goodyear joined the company in 1941 in the manufacturing department. He was appointed production manager in 1947, and in 1948 was made assistant to the vice president in charge of sales. He was elected to the board of directors in 1952 and a vice president in 1953, followed by promotion to executive vice president in 1955.

### Lovejoy acquires control of Hi-Lo Mfg. Company

LOVEJOY FLEXIBLE COUPLING CO., Chicago, Ill., has acquired controlling interest in Hi-Lo Manufacturing Co., formerly Equipment Engineering Co., of Minneapolis, Minn. Hi-Lo will continue operations under the presidency of V. G. Nordley, who will also act as a director. Patrick Hennessy and Fred M. Allen also have been named directors.

### Named Acme-Hamilton sales representative

ACME - HAMILTON MFG. CORP., Trenton, N. J., has announced the appointment of John B. Townsend as sales representative for the territory comprising Maine, Vermont, New Hampshire, Massachusetts and Rhode Island. Mr. Townsend, a graduate of Williams College, joined the company in 1947.



### Lease elected director of Athey Products Corp.

WILLIAM D. LEASE has been elected executive vice president and a member of the board of directors of Athey Products Corp., Chicago, Ill. Mr. Lease, who joined the company in 1946, has served as plant engineer, manager of research and development, and since 1954, as vice president of sales.

### Mason named president of Boston Woven Hose

JAMES N. MASON has been elected president and general manager of the Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Inc., Boston, Mass. He will succeed John M. Bierer who is retiring. At the request of the board of directors, Mr. Bierer has agreed to continue as a director and vice president.

Mr. Mason joined the company in 1953 as head of its research and development department, and that year was elected vice president in charge of manufacturing and development. In 1954 he was made a director and in 1955 was named executive vice president. In 1957, following the merger of Boston Woven Hose with American Biltrite, he was elected a director and vice president of American Biltrite.

(Continued on page 162)





At the North Jersey Quarry Co., Summit, N.J., a Bucyrus-Erie 4½-yd. 110-B loads out blasted rock for hauling to crusher.

## PROFITABLE EXPERIENCE

### brings customers back for more

When final operating figures are tallied, it's the Bucyrus-Erie that produces more at less cost per ton . . . makes repeat buyers of customer after customer.

There are good reasons why Bucyrus-Eries give this kind of performance. Bucyrus-Erie-improved Ward Leonard controls have revolutionized shovel operation by giving operators immediate extra torque to meet every load, faster acceleration and deceleration on every move. Their consistency has been job-proved. They require little maintenance.

Bucyrus-Erie's exclusive two-section boom with tubular dipper handle provides unusual strength with minimum weight. Twin dual hoist concentrates power at the point of greatest resistance to steady the dipper and pull it through the toughest banks.

From the treads up, Bucyrus-Erie electric shovels are heavy-duty units designed to give you greatest output at lowest cost. Write today for complete information on the 4½-yd. 110-B, 6-yd. 150-B or the 8-yd. 190-B. Bucyrus-Erie Company, South Milwaukee, Wisconsin.



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ROCK PRODUCTS, July, 1958

187L38

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**UNIVERSAL VIBRATING SCREEN CO.**

Racine, Wisconsin

Quality Screens Since 1919

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## MANUFACTURERS NEWS

(Continued from page 160)



### C. F. Doepke made manager

THE APPOINTMENT OF Charles F. Doepke as manager of public relations and advertising for Fairbanks, Morse & Co., Chicago, Ill., has been announced by Robert H. Morse, Jr., president. Mr. Doepke, formerly staff assistant to the vice president in charge of sales, succeeds Henry J. Barbour. Mr. Barbour will remain with the company for some time as counselor on advertising and public relations.

### Expansion Joint Institute elects new officers

DURING ITS RECENT ANNUAL MEETING, Expansion Joint Institute elected the following officers and members of the board: Wallace C. Fischer, Serviced Products Corp., Chicago, Ill., president; William E. Hagemeister, Prestite-Keystone Engineering Products Co., St. Louis, Mo., vice president; H. G. Meadows, W. R. Meadows, Inc., Elgin, Ill., treasurer. F. W. Lagerquist, The Celotex Corp., Chicago, Ill., also was elected to the board.

### CIMA Parts Council meets

THE CONSTRUCTION INDUSTRY MANUFACTURERS Association's Parts Council held its third all day meeting recently in Chicago, Ill. The theme of the meeting was manufacturers' programs for training distributors and personnel on parts salesmanship and management. Members considered the meeting a success and began making plans for another to be held in Chicago, September 26.

During the meeting, an announcement was made of the election of Don L. Douglass as chairman of the CIMA Parts Council executive committee. Mr. Douglass is assistant to the presi-

dent, The Thew Shovel Co., Lorain, Ohio. Elected vice chairman of the committee was C. W. McIntyre, manager, parts and service department, Blaw-Knox Co., Construction Equipment Div., Mattoon, Ill.

### Joins Boston Woven Hose

CARL G. LINK has been appointed to the newly created post of eastern regional manager of the Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Boston, Mass. Mr. Link was formerly sales manager of The New York Belting and Packing Co.

### Named OTC sales manager

THE APPOINTMENT OF Lee Gilbert as district sales manager of Southern California and Arizona has been announced by Owatonna Tool Co., Owatonna, Minn. Mr. Gilbert has been serving as a factory representative, handling several lines of hydraulic equipment and machinery.

### Kaiser refractory brick described in manual

KAISER CHEMICALS DIV., Kaiser Aluminum & Chemical Sales, Inc., Oakland, Calif., has described correct methods of installing basic refractory brick in the hot zones of rotary kilns in its booklet "Kaiser Brick for Kiln Hot Zones." The 32-page illustrated manual describes the step-by-step procedures for installing both Unitab kiln liners and the conventional bare liners. Also included is information on material requirements, maintenance, ordering, shipping and handling.

### Euclid regional manager

THE APPOINTMENT OF D. B. Currence as southern regional manager has been announced by the Euclid Division, General Motors Corp., Cleveland, Ohio. Mr. Currence, formerly a representative in Colorado, replaces Charles B. Pace who resigned to establish a Euclid dealership.

### Sika opens new offices

SIKA CHEMICAL CORP., Passaic, N.J., has opened district offices in Atlanta, Ga., and New Orleans, La. Thomas Seale has been appointed Atlanta district manager to serve Georgia, South Carolina, Alabama, eastern Tennessee and northern Florida. Harold H. Brown is New Orleans district manager. The new office will serve dealers in Baton Rouge and Shreveport, La.



### Joins Cardinal Scale

WILLIAM M. BAKER, former sales representative of Flint Steel Corp., Tulsa, Okla., has been made sales manager of Cardinal Scale Mfg. Co., Webb City, Mo. Mr. Baker has served as assistant sales manager with the Webb Corp. and Marsh Steel Corp.

### Lengor sales manager

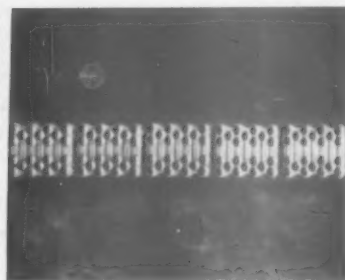
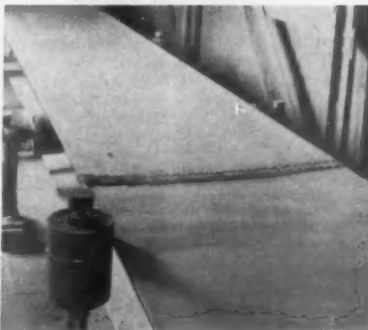
LENGOR Co., Annapolis, Md., has appointed Harold Sharp as national sales manager of its Simplex oil testing kit. Mr. Sharp will be in charge of all company sales and promotion within the U. S.

END



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**CRESCENT PLATES**  
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For particularly abrasive conditions Crescent Countersunk Plates and Countersunk Rivets reduce wear to a MINIMUM.

Order today from your  
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## RP BUYER RESEARCH SERVICE PRODUCER PURCHASING SERVICE FREE

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| — Aftercoolers, Air     | — Buckets               | — Drilling Accessories  | — Grinding Media         | — Shovels, Power      |
| — Agitators             | — Bulldozers            | — Drills                | — Gypsum Plant Machinery | — Speed Reducers      |
| — Aggregates (special)  | — Cars, Industrial      | — Dryers                | — Hard Surfacing         | — Tanks, Storage      |
| — Air Compressors       | — Classifiers           | — Dump Bodies           | — Materials              | — Tires and Tubes     |
| — Asphalt Mixing Plants | — Clutches              | — Dust Collecting       | — Hoists                 | — Torque Converters   |
| — Bagging Machines      | — Coal Pulverizing      | — Equipment & Supplies  | — Hoppers                | — Tractor Shovels     |
| — Bags                  | — Equipment             | — Electric Motors       | — Kilns: Rotary, Shaft,  | — Tractors            |
| — Sarges                | — Concentrating Tables  | — Engineering Service   | — Vertical               | — Trailer Dump Bodies |
| — Belting, Conveyor     | — Crushers              | — Consulting and De-    | — Locomotives            | — Trucks, Bulk Cement |
| — Elevator, Power       | — Coolers               | — signing               | — Lubricants             | — Trucks, Industrial  |
| — Transmission          | — Cranes                | — Explosives & Dynamite | — Magnetic Separators    | — Trucks, Mixer Body  |
| — Belting, V-type       | — Derricks              | — Fans and Blowers      | — Mills                  | — Trucks, Motor       |
| — Belt Repair           | — Dewatering Equipment, | — Feeders               | — Pipe                   | — Valves              |
| — Equipment             | — Sand                  | — Fifth Wheel Heavy     | — Pumps                  | — Vibrators           |
| — Bin Level Indicators  | — Diesel Engines        | — Duty Special          | — Scales                 | — Welding and Cutting |
| — Bins and Batching     | — Dragline Cableway     | — Flotation Equipment   | — Screen Cloth           | — Equipment           |
| — Equipment             | — Excavators            | — Front End Loaders     | — Screens                | — Winches             |
| — Bits                  | — Draglines             | — Gasoline Engines      | — Scrubbers: Crushed     | — Wire Cloth          |
| — Blasting Supplies     | — Dredge Pumps          | — Gear Reducers         | — Stone, Gravel          | — Wire Rope           |
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All above information is strictly confidential to be used to guide the manufacturers in supplying proper information.

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2400 Lima Dragline, 130', 5 yd.  
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3500 Manitowoc Dragline, 80', 2½ yd.  
170-B Bucyrus Erie 6½ yd. Elec. Shovel  
150-B Bucyrus Erie 6 yd. Elec. Shovel  
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Smaller Shovels & Draglines available  
Model T-750 Reich Heavy Truck Mounted  
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104" x 70" Ruggles Cole Dryer  
9' x 125" x 11" Rotary Kiln 30 H.P.  
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36" x 48" Buchanan Jaw Crusher  
±60 Williams Hammermill  
Robinson ±13 Saw Tooth 15 HP Crusher  
Jeffrey Hammermills, 24"x18"; 20"x12"; 15"x8"  
Pennsylvania C-3-30 Hammermill, 60 HP  
Raymond 3 Roll High Side Mill with Double  
Whizzer, Fan and Dust Collector  
18 Bins, 15 to 200 ton  
Rotacone Dust Collector Size 36 Type W  
(4) 24" x 550' Belt Conveyors  
42" x 500' Apron Conveyor, mesh belt  
26" x 27' Drag Conveyor 10 H.P.  
24" x 10' Pug Mill 30 H.P.  
4' x 6' & 4' x 8' Hammer Single Deck Screens  
12" Merrick Weightometer Pivoted type  
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complete with A.W. Feeder 3x8 and Cum-  
mins 135 H.P. Diesel Engine—24" Belt  
Conveyor—3x8 Gruendler Hammer Mill  
with Murphy Diesel No. 650 Engine—Buck-  
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pacity each—4x10 Double Deck Seco Screen,  
complete with Ball tray attachment.  
Will sell as a unit or separate items. Can  
be inspected in operation any time within  
the next 60 days.

THE OWENS STONE CO.

Ostrander, Ohio

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One double deck Deister Type 246 PLAT-O  
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motor support, and V-belt drive, in good op-  
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1-34E dual drum Kohring paver in good con-  
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2-two cu. yd. Smith mixers 88 .....200  
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wheel .....1,800  
1-American Blower fan, 50" wheel .....450  
1-American Blower high pressure blower with  
fluid drive and Hauck 750 combination oil and  
gas burner. This burner operates on 38 gas  
pressure 60 hp. electric motor included ..1,300

### WANTED

1-4 by 10' Robbins vibrex screen with two decks  
1-150 hp. electric motor at 1200 rpm. Also start-  
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1-100 hp. electric motor at 1800 rpm. Also start-  
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Jeffrey vibrator feeders capacity fifty tons to  
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TRAYLOR 7'0" x 35'0" BALL MILL  
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Unit in excellent condition.  
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**MODERN STONE CRUSHING PLANT:** Complete with 25 x 40 roller bearing Jaw Crusher, two 36" and one 24" Cone Crushers, 4x8, 3 deck Screens, Belt Conveyors, Apron Feeders, Truck Scale, Magnetic Pulley, all motors, controls, with or without trucks and shovels.

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**JAW CRUSHERS:** 10 x 15, 10 x 20, 12 x 24, 15 x 36, 24 x 36, 25 x 40, 30 x 42 and 40 x 42". One 13 x 30" and one 24 x 72" sectionalised for underground use.

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**AIR SEPARATORS:** Sturtevant 16 ft.

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2—42-T BUCYRUS-ERIE Wire Line Blast Hole Drills

1—New RCA Metal Detector—10" x 36" Aperture

1—FULLER-KINYON System

1—Second-hand Drop Ball (3200 lbs.)

9—New Well Drill Bits—3 1/4" x 4 1/4"—7 API Joints

2—PENNSYLVANIA, Class DE-2, two stage, duplex, cross compound, (direct connected), Synchronous Motor Driven Air Compressors.

Low Pressure Air Cylinder Diameter 20"

High Pressure Air Cylinder Diameter 12"

Stroke 14"

1—4' x 6' KENNEDY VAN SAUN Double Deck Vibrating Screen

**NEW YORK TRAP ROCK CORP.**

Old Mill Road

West Nyack, New York

Telephone - NYack 7-4300

**CRUSHERS:** 24x36 CR RB Jaw w/3x8 Feeder, 28x36 Traylor PB Blake type Jaw, 30x12 Pioneer RB Jaw, 42x40 Superior PB Jaw w/motor, 10x24 Lippman RB Jaw, Teismith 13B, 24", 28", 36" Gyrotrators

**PLANTS:** 2036 Univ. 1836 Lippman

**CONVEYORS:** 24" x 280', 24" x 1800', 42" x 160' 3-Strip Lee DERRICKS 6 ton @ 78' radius, 25 ton G. E. Diesel Elec. std. ga. LOCOMOTIVE, 30 ton Lima, 25 ton Koehring Truck CRANES.

**MILLS:** 4 1/2'x16' 6x18' 7x36' Hardinge Conical, KVA 4x8, Allis 6x15 Ball, Raymond 66" Roll, 2033 CR Hammer, 3 1/2'x7' Rod

2 drum 300 HP & 200 HP Slope HOISTS

435 KW & 938 KVA Diesel Generator Sets

**DRYERS:** 4 1/2'x26, 5 1/2'x24, 5x48, 6x15, 7x60, 8x124, 10x124

**SHOVELS-DRAG:** NW40D, Marion 40A, Lorain 77, 820 Lima 1201, BE 320B, 9W.

Reprints: Bonded Scale & Machine Co.

**MID-CONTINENT EQUIPMENT CO., INC.**  
8321 Gannon—St. Louis 24, Mo.—WYdown 1-2826

## LIQUIDATION

### KILNS—COOLERS—DRYERS

- 1—Traylor 10' x 120' Rotary Kiln.
- 1—Vulcan 6' x 50' Rotary Kiln
- 2—Ruggles Cole 90" x 55' Rotary Dryers
- 1—Christie 80" x 65' Rotary Dryer
- 1—Gr. Western 6' x 50' Rotary Dryer.
- 1—Rennsburg 5'6" x 50' Rotary Dryer
- 3—Link Belt 3'10" x 20', 5'2" x 20', 6'4" x 24' Roto Louvre Dryers.

### PULVERIZERS—MILLS—CRUSHERS

- 1—Allis Chalmers 7' x 24' two compartment Compeb Mill 450 HP motor
- 1—Penn. No. 5060 Non-Clog Hammer Mill, Unused.
- 1—Allis Chalmers 5' x 22' steel lined Tube Mill 200 HP motor
- 1—Hardinge 5' x 10' Rod Mill
- 2—54" x 24" double roll Crushers
- 1—Symons 30" Impact Crusher

### SCREENS—CONVEYORS—BINS

- 3—Gayco 8' and 5' Air Separators
- 4—Tyler Hummer 4' x 10', 4' x 5' Vibrating Screens.
- 5—Link Belt, Allis Chalmers 3' x 8' Screens
- 1—Symons 3' x 8' double deck Screen
- 2—42" Apron Conveyors 65' long
- 2—84" Apron Belt Conveyors 20' long
- 1—48" Troughing Belt Conveyor 25'
- 15—24" Troughing Belt Conveyors 18' to 150'
- 6—18" Troughing Belt Conveyors 35' to 80'
- 30—Steel Bins and Hoppers from 50 to 500 ton capacity.

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Every Item Priced for Quick Sale

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### ELEC. AIR COMPRESSORS

3—3078 CFM Inger. Rand 500 H.P. New 1947 1—3876', 1—1578' and 2—1098' Inger. Rand

**DIESEL ELEC. LOCOMOTIVES**  
4—65 ton Whitcomb—2—25 ton & 1—70 Ton G. E. 20 Ton Davenport Gas Locomotive.

### ROTARY DRYERS & KILNS

4' x 20', 5' x 25', 6' x 72', 8' x 150', 11' x 200'

### REDUCTION MILLS & FEEDERS

8'6" x 12' Marcy Rod  
6'6" x 14'5" Marcy Rod Mill  
4' x 8' Hardinge Rod Mill

5' x 10' Kennedy-Van Saun Rod Mill  
2—No. 77 & 1—96 Marcy Ball Mills  
8' x 60" Hardinge Ball Mill

4'-0" Traylor Type TY Reduction Crusher  
36 x 42 Traylor Jaw Crushers

25B Teismith Primary Breaker  
10A Teismith Primary Breaker  
30" x 36" Traylor Type H Jaw Crusher

18" Superior McCully Secondary  
15x24 & 10x36 Cedar Rapids Jaw  
60" x 15' Traylor MD Apron Feeder

### VIBRATING SCREENS

2—4 x 8 Seco 2 Deck. 1—5 x 12, 3 Deck  
4 ELEC. WHIRLEY CRANES

2 Amer. R25-75 Gantry 165' Boom  
2 Amer. R20-60 Gantry 139' Boom

### R. C. STANHOPE, INC.

68 E. 42nd St., N.Y. 17, N.Y.

### CABLEWAY, 10 TON SAUERMAN

900 Ft. span, fixed steel head tower 125 Ft. high, movable tail tower 60 Ft. high.

Diesel Power. New 1952, discontinued 1954.

### BREW, WOLTMAN & CO., INC.

50 Church St., New York 7, N.Y.

### QUARRY EQUIPMENT

Cedarapids 2540 Jaw crusher. Reconditioned.  
Cedarapids 3042 double impeller. Rebuilt.  
Cedarapids 1038 roller bearing jaw crusher.  
Cedarapids 2033 hammermill. Rebuilt.  
Telesmith 24" cone crusher. Good.  
Telesmith 13 B gyratory crusher.  
Cedarapids 42" x 10' apron feeder. New.  
Robins 4' x 9' triple deck screen. Reconditioned.  
Cedarapids 4' x 12' double deck screen. Rebuilt.  
New Holland 4' x 12' double deck screen. Rebuilt.  
Pioneer 4' x 8' double deck screen. Rebuilt.  
Smithco 24" x 60' portable belt conveyor.  
27 1/2 ton, single-compartment 8' x 12' bin.  
60-ton, two-compartment, 8' x 18' storage bin with clam gates.  
100-ton, two compartment, 13' x 23' bin.  
Special bins to your specifications.  
Conveyors—18"—24"—30"—36". Also conveyor beltins.

### SHOVELS AND CRANES

Lorain 820 2-yd. diesel shovel-crane  
Lorain 82 2-yd. diesel shovel.  
P & H 655B-LC, 2-yd. diesel dragline.  
Lorain 72, 1 1/2 yd. diesel dragline.  
Lorain 70-7 1 1/2 yd. diesel dragline.  
Lorain 79 1 1/2 yd. diesel shovel.  
P&H 655B 1 1/2 yd. diesel dragline.  
Bucyrus-Erie 38B, 1 1/2-yard diesel dragline. Rebuilt.  
Lorain L-26, 3 1/2 yd. diesel clamdrag.  
Lorain L-25J 3 1/2 yd. Diesel Clam-Hoe.  
Lorain L-41 3 1/2 yd. diesel backhoe.  
Link Belt LS-85 3 1/2-yard diesel shovel-drag.  
Lima 34 Paymaster 3 1/2-yard diesel shovel. Good.  
Unit 1020 3 1/2-yard diesel powered shovel-crane.  
Lorain TL25B 3 1/2 yd. gas clam-crane.  
Insley K-12, 1 1/2 yd. gas clam-crane.  
Insley K-12 1 1/2 yd. gas dragline. As is.  
Koehring 304 3 1/2 yd. diesel shovel-hoe.  
Koehring 304 3 1/2 yd. diesel backhoe.  
2—Lorain MC-414 20-ton Moto-Cranes.  
Link Belt HC-90 25-ton truck cranes.  
Lorain MC-504W 25-ton Moto-Crane.  
Lorain MC-4 15-ton Moto-Crane.  
2—Lorain TL-20 10-ton gas Moto-crane.  
Lorain SP-107, 7-ton self-propelled crane.

### TRACTORS, TRUCKS, SCRAPERS, ETC.

2—Euclid TS-18 twin engine scrapers.  
4—Euclid TS-24 twin engine scrapers.  
4—Euclid TS-18, overhung engine scrapers.  
1—Euclid LS-12, six wheel scraper.  
1—Euclid TC-12 twin engine tractor.  
10—Euclid 22-ton rear dumps. Excellent.  
1—Mark LRM 15-ton rear dump. Rebuilt.  
1—Pulman S-600, 6 to 8 yard scraper.  
1—Caterpillar DW-10 scraper.  
1—International TD 18 with Bucyrus-Erie bulldozer blade. Excellent condition.  
1—Euclid tractor with 3200 gallon water tank semitrailer.  
1—Caterpillar D-7 with cable bulldozer blade.  
1—Caterpillar D-4 Tractor only.  
1—Austin Western diesel powered grader.  
1—International 300 tractor, with loader back hoe.  
1—LaPlante choate 13 1/2 yd. Cable scraper.  
1—Atco H85, 10 1/2 yd. Hydraulic scraper.

### SHOVEL ATTACHMENTS

Lorain 820, 2-yd., 23' boom, 21' stick  
Lorain 50, 1-yd., 21' boom, 17' stick  
Lorain 40, 3/4-yd., 19' boom, 16' stick  
Lorain 30A, 1 1/2-yd., 18' boom, 15' stick  
Osgood 903, 2-yd., 24' boom, 20'6" stick.

### BACKHOE ATTACHMENTS

Lorain 40A, 18' boom, 7' stick, 28", 36" or 44" bucket.  
Koehring 304, 19' boom, 5' stick.

### DIESEL POWER UNITS

Cat. D7700, 74 H.P. at 1000 RPM. Rebuilt.  
Cat. D8800, 88 H.P. at 1000 RPM.  
Cat. D13000, 128 H.P. at 1000 RPM. Rebuilt.  
GMC Twin Diesel, rebuilt.  
GMC 3021C, 3-cylinder, new.

### AIR COMPRESSORS

105 cu. ft. LeRoi tractor with dozer, backhoe.  
105 cu. ft. Ingersoll-Rand gas portable.  
125 cu. ft. Jaeger gas portable.  
210 cu. ft. Gardner Denver gas portable.  
315 cu. ft. Schramm gas portable.  
500 cu. ft. Ingersoll-Rand, Waukesha power.  
600 cu. ft. Gardner-Denver diesel portable.  
420 cu. ft. Gardner-Denver two-stage stationary Rebuilt.

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### FOR SALE or RENT

65 ton Whitcomb diesel elec. loco.  
44 ton Gen Elec. diesel elec. loco.  
25 ton Whitcomb diesel elec. loco.  
50 ton American guy derrick 115' mast 100' boom  
90 HP Lidgerwood 2d diesel hoist.  
150 HP Amer. #140 3d gas hoist.  
1 1/2 yd. Lime 602 crane. 110' boom.  
2 1/2 yd. Link-Belt K-595 crane 120' boom. Cat. diesel  
60 ton Manitowoc 3900 crane. New 1954. 100' boom. Cummins diesel  
110 HP Clayton Port. steam generator  
**WHISKEY EQUIPMENT CO.**  
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# BONDED EQUIPMENT BARGAINS

NEW CURRENT MODELS IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE

## NEW BONDED® GENERAL AND HEAVY DUTY VIBRATING SCREENS



For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

**GENERAL DUTY SCREENS, TYPE A:** Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. **WRITE FOR BULL. #1086.**

Model Number	Screening Area	No. of Decks	Sale Price
124A	2'x4'	1	\$ 443
224A	2'x4'	2	472
126A	2'x6'	1	472
226A	2'x6'	2	501
134A	3'x4'	1	504
234A	3'x4'	2	570
136A	3'x6'	1	581
236A	3'x6'	2	658
336A	3'x6'	3	956
138A	3'x8'	1	875
238A	3'x8'	2	915
338A	3'x8'	3	996

**HEAVY DUTY MODELS, TYPE B:** Four bearing positive throw eccentric shaft: 3' x 6' to 5' x 14', 1 to 5 decks. **WRITE FOR BULL. #1087.**

Model Number	Screening Area	No. of Decks	Sale Price
336B	3'x6'	3	\$1620
436B	4'x6'	4	1685
138B	3'x8'	1	1510
238B	3'x8'	2	1620
338B	3'x8'	3	1735
248B	4'x8'	2	2310
348B	4'x8'	3	2440
2410B	4'x10'	2	2480
3410B	4'x10'	3	2550
2412B	4'x12'	2	2590
3412B	4'x12'	3	2970
4412B	4'x12'	4	3165

## NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Remember, You Save Up To 50%



CONVEYOR PRICES INCLUDE BELTING

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. 1 Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams, with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2 1/4" or 3 1/4" diameter shaft.

We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck 1/4" top rubber cover x 1/4" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

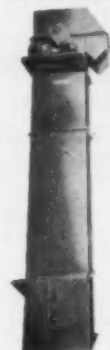
A full line of accessories available, including carrying and return belt covers. See our ad on opposite page.

Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	\$1397	\$ 722
14"	50'	2223	1144
14"	85'	3377	1733
16"	20'	1262	636
16"	45'	2137	1088
16"	60'	2662	1359
16"	90'	3712	1900
18"	25'	1477	794
18"	45'	2317	1166
18"	70'	3142	1648
18"	85'	3697	1933
18"	100'	4252	2220
18"	130'	5362	2797
20"	25'	1517	828
20"	60'	2882	1523
20"	75'	3467	1838
20"	90'	4052	2145
24"	25'	1590	898
24"	45'	2430	1330
24"	70'	3480	1875
24"	100'	4740	2514
24"	120'	5560	2950
24"	150'	6840	3603
30"	50'	2911	1617
30"	70'	3871	2119
30"	90'	4831	2614
36"	25'	1818	1118
36"	45'	2858	1678
36"	60'	3635	2096
36"	100'	5718	3214

For conveyors longer or shorter than those listed above, add or deduct the following per foot prices according to belt width. Prices include belting. **WRITE FOR BULLETIN #1138.**

For 14" belt	\$16.84 per foot
For 16" belt	18.04 per foot
For 18" belt	19.24 per foot
For 20" belt	20.37 per foot
For 24" belt	21.78 per foot
For 30" belt	24.75 per foot
For 36" belt	27.95 per foot

## NEW BONDED BUCKET ELEVATORS



Open or Enclosed, Vertical or Inclined Bucket Elevators with Continuous or Spaced Buckets mounted on Chain or Belting. Bonded's 19 standard models mean lower prices and you get a Custom Built Elevator at no extra cost. There is a style of bucket for virtually every material or condition: wet or dry, lumpy or fine, granular, silvery, or pellet shapes, hot or chemically active. Prices listed below are for Vertical Enclosed Elevator. Other sizes, styles, and types available in both chain and belt type elevators, at equally low prices and will be quoted on request. A complete line of Continuous Steel, Salem Steel and Malleable Iron Buckets available in a wide variety of sizes, shapes, gauges and styles at low prices. **WRITE FOR BULLETIN #1293.**

Model No.	Bucket Size Inches (Discharge Ht.)	First 20' Deduct	Add or Per Ft.
Style "A" Spaced Malleable Buckets On Chain			
CS3A	5 x 3 1/2	\$1071.50	\$29.25
CS4A	6 x 4	1088.50	31.00
CS5A	8 x 5	1235.00	35.50
CI06A	10 x 6	1281.00	37.50
CI27A	12 x 7	1510.00	31.25
CI48A	14 x 8	1672.50	36.00

Style "A" Spaced Malleable Buckets On Belt			
B33A	5x3 1/2	\$1099.00	\$29.50
B64A	6x4	1116.50	31.25
B85A	8x5	1211.50	37.25
B106A	10x6	1281.50	37.50
B127A	12x7	1654.50	37.25

Style "E" Continuous Steel Buckets On Chain			
C85E	8x5 1/2	\$1297.00	\$31.25
CI28E	12x8 1/2	1599.00	34.25
CI08E	10x8 1/2	1094.00	34.75
CI28E	12x8 1/2	1094.00	35.50
CI48E	14x8 1/2	1718.00	36.75

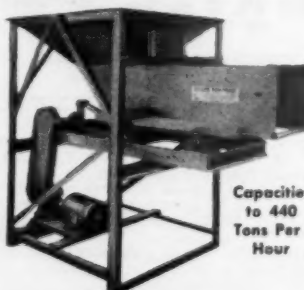
## NEW BONDED® FEEDERS



Capacities to 60 TPH

Bonded EF Series Economy Feeders are ideal for confined spaces and in portable plants. For medium duty service. Available with or without hoppers.

EF Series Pan Feeder - Priced From \$224.00



Capacities to 440 Tons Per Hour

## Bonded HDF-18 Heavy Duty Feeders

were especially designed for abrasive materials such as Ore, Rock, Crushed Stone, Gravel, Sand, Clinkers, Abrasive Volcanic Ash and Rock. Abrasion Resistant Alloy Steel Plate is used for all parts that contact the material. Feeders are process control instruments as well as material movers and help to prevent screens, crushers, grinders, etc., from being run empty, choke fed, or over-loaded.

HDF Series Plate Feeder - Priced From \$925.00

**WRITE FOR BULLETIN No. 1211**

## BONDED SCALE AND MACHINE COMPANY

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Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders

COLUMBUS 7, OHIO

## DEPENDABLE USED MACHINES

Special: American 50B, 3-drum hoist with slewer

Hopto 120 on Chev. truck  
Adams Tandem Grader 42-C  
Telsmith d.d. screens  
Unit 614 1/2 yd. backhoe  
24"x48" magnetic pulley

Lorain 41 crane & dragline  
Day City 25 1/2 yd. hoe  
Inley K-12 1/2 yd. dragline  
Eagle 24"x25" single screw  
Harris Power Horse Hi-lift

Tandem trailer  
2 yd. Dumperete  
American car pullers  
H & B 6" pump #496  
Rolls 202, 8' paver

This equipment rebuilt in our modern plant by expert mechanics. Come see it!  
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TRACTOR & EQUIPMENT CO.

Oak Lawn, Ill.

## FOR SALE

Used 9 K Gyrotory Crusher A. C.  
Spare Parts Included

GARY SLAG CORPORATION  
542 S. Dearborn St., Chicago 5, Illinois  
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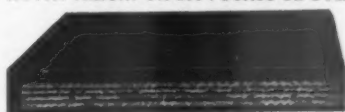
# BUILD YOUR OWN CONVEYOR

WITH BONDED CONVEYOR PARTS & ACCESSORIES

NEW CURRENT MODELS IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE

**NEW CONVEYOR BELTING  
AT NEW LOW PRICES  
SAVE UP TO 44%**

WE PAY FREIGHT ON 200 POUNDS OR OVER



## QUALITY TESTED CONVEYOR BELTING\*

Major Brand: 12# to 15# Average Friction  
Pull. 800# to 1000# Average Cover Tensile.

Heavy Duty 4-ply, 28-oz. duck, 1 1/2" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price	Sale Price
14"	4	\$3.63 ft.	\$2.29 ft.
16"	4	4.08 ft.	2.41 ft.
18"	4	4.51 ft.	2.65 ft.
20"	4	4.97 ft.	3.08 ft.
24"	4	5.85 ft.	3.45 ft.
30"	4	7.19 ft.	4.25 ft.
36"	4	8.51 ft.	5.01 ft.

Major Bee Brand: 16# to 19# Average Friction  
Pull. 2500# to 3000# Average Cover Tensile.  
Shim cost between piles.

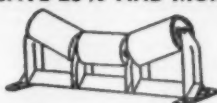
A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1 1/2" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnage and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

Width	Ply	List Price	Sale Price
14"	4	\$4.21 ft.	\$2.48 ft.
16"	4	4.85 ft.	2.80 ft.
18"	4	5.39 ft.	3.10 ft.
20"	4	5.90 ft.	3.54 ft.
24"	4	6.94 ft.	4.00 ft.
30"	4	8.53 ft.	4.92 ft.
36"	4	10.09 ft.	5.95 ft.
24"	5	8.14 ft.	4.68 ft.

\*All belting is tested by the Engineering Laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.

Other widths, piles, duck weights and cover thickness available at low prices.  
WRITE FOR FREE SAMPLE & BULL. #1209

**NEW IDLERS AND RETURN ROLLS  
SAVE 25% AND MORE**



3-roll, 5" diameter Troughing Idlers for:		
14" belt	\$18.50	24" belt \$21.25
16" belt	19.25	30" belt 22.00
18" belt	20.50	36" belt 22.75
20" belt	20.75	48" belt 25.50

1-roll, 5" diameter Return Idlers for:		
14" belt	\$7.25	24" belt \$ 8.50
16" belt	7.50	30" belt 9.50
18" belt	8.00	36" belt 10.00
20" belt	8.25	48" belt 11.50

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable pre-lubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings at slight additional cost. Maintenance is negligible. Bonded Rubber Disc Impact Idlers priced from \$61.00. WRITE FOR BULLETIN #1138.



## CONTINUOUS STEEL ELEVATOR BUCKETS

Buckets are 12 gauge medium front, not overlapping. Other sizes, gauges and styles available at equally low prices.

WRITE FOR BULL. #1203

Bucket Size Inches	Price Each	Bucket Size Inches	Price Each
8x5x 7 1/4	\$2.83	12x6x 9 1/4	\$3.81
9x6x 9 1/4	3.43	12x7x11 1/4	4.53
10x5x 7 1/4	2.94	12x8x11 1/4	4.90
10x6x 9 1/4	3.55	14x7x11 1/4	4.90
10x7x11 1/4	4.29	14x8x11 1/4	5.27
10x8x11 1/4	4.53	16x8x11 1/4	5.51
11x6x 9 1/4	3.67	18x8x11 1/4	5.87
		20x8x11 1/4	6.13

## BONDED CONVEYOR PARTS & ACCESSORIES

Bonded Troughing Idler Conveyors (described on opposite page) can be equipped with any accessories described below or use them on your present conveyor or Bucket Elevator. WRITE FOR BULLETIN #1138.



Return Belt Guide Idler \$11.75



Carry Belt Guide Idler \$14.50



Head & Tail \$149.00



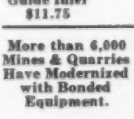
Self-Aligning Idler \$69.75



Flat Roll Idler \$13.50



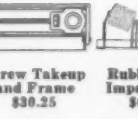
Holdback \$99.00



Wing Pulley \$71.00



Screw Takeup \$30.25



Rubber Disc Impact Idler \$61.00



1 H.P. Speed Reducer \$59.50



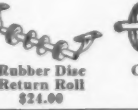
Conveyor Pulley \$7.25



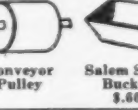
Return Roller \$7.25



Self Aligning Return Roller \$49.25



Rubber Disc Return Roller \$24.00



Conveyor Pulley \$7.25



Salem Steel Bucket \$6.00



Gravity Takeup \$413.00

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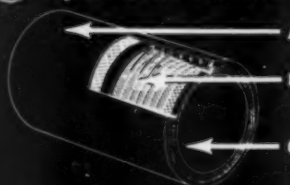
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